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GLEANINGS IN BEE CULTURE

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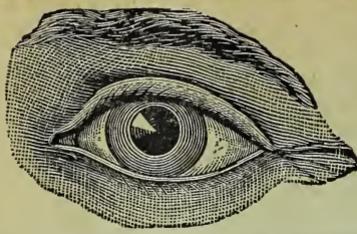
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GLEANINGS IN BEE CULTURE

A JOURNAL
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AND HONEY,
AND HOME
INTERESTS.

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No. 2



HARRY LATHROP says, p. 21, "Farmers as a class will not buy honey." Isn't that a matter of "locality," Harry?

MURRAY's tag-and-block are all right, p. 31; but the more important question is what to have durable with plain figures, at not more than one or two cents a tag.

WHY IS IT that in Cuba the honey harvest is in winter instead of summer? [Say, you did not label this as a joke. As I am in the dark as to whether it is or not, I will let you answer it.—ED.]

APIS MELLIFICA is given in the Standard dictionary as a variant of mellifera, and is as yet in more common use, although it may go out of use if, as I think, Prof. Cook is following a higher authority in using mellifera. Will Prof. Cook please tell us how that is?

W. W. BROCKUNIER, p. 30, found three clipped queens on the ground with a ball of bees, and a fourth one with the swarm on the ground. About what I would expect with my bees if they could not easily get back into the hive, and were left long enough.

IT MIGHT BE just as well to tell the beginner that the artist has taken liberties with that gob of jelly in the jelly-spoon, p. 19, and swelled it up quite a bit. [Yes, you are right. It is not always possible for an artist to catch on to all the fine points in bee-work.—ED.]

A REQUEST is made at the close of p. 30 for me to read the preceding item. I'm glad of that as a text to say a few words, especially to beginners. There is no need to make any such request, for I never dare to leave any thing in a bee-journal unread.

If I should skip a single item, even if written by the greenest recruit, I might skip something I do not already know.

ALLOW me to say to C. J. Pearse, p. 31, that, after some experience with horses, cows, sheep, and pigs in a bee-yard, I have had most trouble with sheep pushing hives off their stands. Hives are too low for horses or cows to rub against, and sheep are probably greater rubbers than pigs.

A. R. HARRINGTON, replying to your question, p. 30, that the editor missed, I think you will find that bees start out earlier in the morning in the sun than in the shade, and fly later in the evening in the sun than in the shade. I've noticed it in bees hauled home and placed north of the shop.

FORMALIN, or formaldehyde, raised fond hopes as to curing foul brood with drugs. Reports of failure have made those hopes grow dim. A report from Prof. F. C. Harrison makes them brighten again. He says in *Canadian Bee Journal* that he knows that spores of *B. alvei* have been destroyed in cells filled with honey; and he thinks the failures may be due to too little strength of the drug, too open boxes, or too short time.

"BETTER than honey for less money" is the claim made for certain corn syrup, so fine that, when "placed where the bee may have access to it, he forsakes the roses and the clover," as he finds the manufactured article more to his taste. Editor York calls it "he-bee molasses." He ought to be prosecuted for libeling the bee and the molasses. I invested 10 cents in the stuff, and one taste was enough. That persistently lingering after-taste said in capitals, "GLUCOSE." Too bad that there's no way of stopping people from lying in advertisements.

MR. EDITOR, on p. 18 you have missed the man who had the largest take of all the members of the National; likely because his take is divided into two columns. M. H. Mendleson took 112,000 pounds of honey, 22,000 of it comb. If 1 pound of comb be equivalent to $1\frac{1}{2}$ of extracted, then his crop,

in terms of extracted honey, was 123,000 pounds. Neither he nor Mercer seemed a bit stuck up over their "fat takes," but talked just as common and pleasant to me as if I'd taken 100,000 pounds of honey and a wagonload of wax. [I am glad you have called my attention to this omission. Mendleson is a modest fellow, and he ought to get the credit for his enormous yield during the past year. We shall, therefore, have to give him the palm for producing the largest crop of honey for 1903 of any bee-keeper in the United States.—Ed.]

PLEASE GIVE US semi-monthly reports of cellar-wintering at Medina. Cellaring under a machine-shop comes within the scope of very few; a large number who have but a few colonies can have the advantage of a roomy cellar as at the Harrington yard; while a smaller number, but with more intense interest, will want to know all about the basswood-yard cellar. How much and what attention do the bees need in that cellar? What is the temperature? [I will endeavor to comply with your request; but let me say right here that Bingham's ideas on the construction of cellars with ventilators 16 inches square I believe are all right. Bingham has always been intensely practical, and he has made no mistake on this question of bee-cellars and their ventilation.—Ed.]

A. I. Root says, p. 36, that, after I've told my wife I love her, I might add that I love her *still*. I do love her *still*, but not too *still*. A woman that keeps up her clatter all the time is very tiresome; but a woman so glum that she never speaks is worse yet. My wife is just about right. [You are right, doctor. Somehow, when I visit your home I always *feel* at home. There is something about the manner of that good wife of yours, and of your sister, that makes me feel as if there were no place in this country, outside of Medina, that is a home to me so much as is that residence on the top of the hill a mile or so out of Marengo. I visit it only once or twice in two or three years; but when I do I laugh and grow fat, and gain a new lease of life.—Ed.]

F. GREINER thinks of using dummies under sections in spite of the fact that bees will not work so well over dummies, p. 25. Try having the dummies in or near the center, friend Greiner. One year, for another purpose, I put a dummy between each two brood-frames during the harvest, and the bees seemed to work the same as if no dummies had been there. [Say, doctor, do you realize that you are giving us a really valuable kink? This point is worth passing around. It is a well-known fact that bees will push along the work in the center of the super faster than on the two outsides. Now, then, if we put the dummy in the center of the brood-nest, we establish a very nice balance throughout the entire super. Why wouldn't this be a good thing to do in the case of any colony whose

brood-nest is not clear up to the average? There are many colonies in every bee-yard of this kind. If they have empty combs to fill up the space they can not reasonably occupy with brood, then they will fill them up with honey. When they do this it is a hard job to force them up into the supers. Now, then, if we had, instead of these combs of honey, a dummy in the center of the brood-nest, and nothing but brood in the combs, we would force the honey, when it did come in, up into the supers. I believe I will paste this in my hat to use next summer.—Ed.]

"NEITHER of us intimated that the old flat cover was perfect," quoth ye editor, p. 12. Oh, no! you merely said there was "nothing better," and Hutch said it was "all right." You say, "I never saw any cover of *any* construction that would not warp, twist, or check, somewhat." Now, Mr. Editor, please stand up in a straight row and answer a few questions:

1. Did you see those 50 hive-covers I had made with a dead-air space, and covered with tin?

2. I think you saw some of them after they had been in use a few years: did you see any that were warped?

3. Did you see any that were twisted?

4. Did you see any that were checked?

Quite possibly you may answer to the last three questions that you did not notice. In that case let me ask you:

5. Do you think it reasonable to suppose that they would warp, twist, or check? I may be allowed to depose that, if there has been any warping, twisting, or checking, I have not noticed it. [I can hardly answer your questions by yes or no. The most I can do is to qualify a general answer. Yes, I saw some double hive covers at Marengo—how many, I do not know. I can not remember distinctly, but I think some of them were warped, and checked too, but only slightly. Yes, I should suppose that they might warp some, and a great deal in some localities. On my eastern trip recently I think it was Arthur C. Miller who said the Dr. Miller covers twisted badly; so this question of covers is somewhat dependent upon locality.—Ed.]

YOU say, "a single board is now out of the question for most localities because of its cost." From a manufacturer's standpoint, possibly; from a bee-keeper's standpoint, most emphatically no. I can afford — so can any bee-keeper — to pay a dollar for a good hive-cover rather than to go without a cover at all. But I know that I can have a good cover without paying a dollar or the half of it.

Besides the 50 tin-covered covers, I have 50 covered with zinc, and I think they are better, although I have not tried them so long. I have also about 400 plain-board covers that have been in use many years, and most of them are of single boards. I give it as my deliberate conviction that, if stuff for single-board covers could be bought

at \$25 a thousand feet, it would be better for me to pay 25, 30, or even 40 cents for the zinc covers, which, aside from freedom from twisting and warping, have the advantage over the plain-board covers that they are cooler in summer and warmer in winter.

This is a matter of very great importance, Mr. Editor, and I hope you'll freely speak your mind. [I think you will find the zinc much more serviceable than the tin. As I have before stated, the old iron used in tin roofing has been displaced by steel. If you will look at your old spoutings and iron roofings you will see that many of them are still good while the more modern tin roofings and spoutings made of steel are comparatively short-lived. I would put zinc-covered roofs first; galvanized sheet steel next (galvanized iron has disappeared from the market); good roofing paper next, and ordinary steel tinplate last.—ED.]

"I THINK I am safe in saying it is away beyond your general average, season after season." That's what you say, Mr. Editor, at the close of my report, p. 13, and I thank you for saying it, as also for your remarks in general about reports. I've had years of entire failure, and more that were nearly failures, and I never yet had any thing that would come anywhere near last year. I've also been saying that I never expect another season like the last, but I'm weakening a little on that. Snow covered the ground the next day after the bees went into the cellar (Nov. 28), and the ground has been covered ever since, with good sleighing now, and it is entirely possible that snow may cover the ground all winter. Under that blanket of snow lies a denser carpet of white clover than there was a year ago, and there is a bare possibility that next season may be as phenomenal as the last. [That same blanket of snow covers a dense carpet of white clover over the whole of the clover regions of the North. As I write, Jan. 13, we are having a heavy snowstorm that is already covering the ground with a still thicker blanket of snow. The protection afforded, and the immense amount of moisture from the slow-melting snow as the warm weather opens up, will do a great amount of good. A heavy rain can not compare with it. Snow melts slowly, and herein lies its value as an irrigant. I believe with you, that, unless we should have some very warm weather in midwinter, followed by severe freezes without snow, we shall have a good clover crop next season. Generally speaking, if there is any thing that can make the heart of the bee-keeper rejoice it is to have heavy snows.—ED.]

You SAY "there must be something 'rotten' in Marengo as well as in wicked Chicago" because my sections averaged 14½ ounces each, instead of weighing "just an even full pound," p. 13. Haven't you got me mixed up with some one else, Mr. Editor? I'm not the man that ever hinted that sections "might, could, would, or should"

be produced to weigh "just an even full pound." On the contrary, I've insisted in the most strenuous manner that the thing couldn't be done, again and again reporting the varying weights in my own experience, and saying that the fair thing was to sell by weight. The specially rotten thing in Chicago is the condition that allows the possibility of a producer getting less for a section weighing "just an even full pound" than for one with less honey in it and no better in any way. That 18,000 pounds of honey was sold for just what it weighed, and there's nothing rotten about that. [In proportion as you do not approve selling light-weight sections by the piece, in that same proportion you should disapprove of producing the naughty (?) ones that are used as a medium of cheating (?). It is just as easy to produce sections averaging 16 ounces as those that average 14½ ounces. You would have to use a little thicker section—say 2 inches, just as are used to-day in England. As long as you and I and all the rest of us produce sections averaging a little over 14 ounces, so long will the trade, in order to simplify calculation and sales, run toward selling by the piece, and it is right. Doctor, I believe you are right in selling sections that weigh 14½ ounces. You do no violation to the great body politic. It is no worse to buy or sell sections by the piece than to buy or sell eggs by the dozen, for some eggs are much larger than others.—ED.]

A. I. Root, I want to say amen to that preaching of yours, p. 34. The man that robs his wife of her fair share of courting when her hair turns white is a sneak and a thief; and you might have added that he cheats himself as much as his wife. Let me tell a little story out of *The Ladies' Home Journal*.

The young girl, Priscilla, was asking the good old Dutch lady: "Do you mean to tell me that, when you married Mr. Blom, you were not well enough acquainted to love him?"

"Na! Ve vas na vell enoof acquainted for dhot."

"You did not love your husband?" asked Priscilla, feeling that the old Dutch lady had suddenly gone very, very far away.

"Vell, you see it's disway," explained the old lady, and the look in her bright old eyes made Priscilla feel that she had indeed gone away from her, but in another direction: "When you marry a man, you drink you luff him. But when you been married a month you find out you luff him so much more dhot you know you didn't know whadt luff vas in de first place. Den, when you been married a year already, andt you begin to call him Fahder, andt he begins to call you Muher—vall, vall, vall, vall! Maybe you don't luff him den, eh? But you don't. De years dey go py, andt dey go py, andt de troubles dey come, andt dey go too. Andt maybe, when you been married fifty year already, den you kin say, honest andt true, 'I luff him,' for den you been puttin' up mid each odder long enoof to find outd for sure."

That's a good bit the way it is at your house and mine, isn't it, old comrade?" [Dear old friend, your story is exactly to the point. Little did I dream, when I wrote the Home paper to which you refer, of the experience that was just before me. Before my talk was even in print, Mrs. Root was near unto death, and I was compelled to look ahead and see what life would be with-

out her—she who had been my comrade and helper toward all that is good almost ever since the days of my boyhood. May God be praised that she is now, Jan. 13, though still very weak, on the road to recovery.—A. I. R.]



Just as the old year finds its close,
The honored soldier, patriot, man,
Lay's down for aye the battered sword
He drew when war began.
Cover him o'er with the flag he loved,
And lay him away to his rest;
His conflicts are over, the victory gained,
He's entered the land of the blest.

A French writer says that the ends of oak twigs, well dried, make a good smoker fuel. They produce a very pungent smoke, are easily gathered, and are of no other use.

A German writer has shown, to his own satisfaction at least, by examining the fecundating fluid of drones that only those drones that come from a fertile queen are of any value. He says if this is true there will be a good many theories to modify and practical applications to make.

BRITISH BEE JOURNAL.

The clipping of queens' wings is not very much practiced in England.

I am pleased to note that Mr. Thos. Wm. Cowan's "British Bee-keepers' Guide-book" has just been translated into Dutch, for the use of people in South Africa, lately conquered by the English. The publishers will please book our order for a copy.

EL COLMENERO ESPAÑOL.

Continuing his review of bee culture in different parts of the world, the editor, the late Mercader-Belloch, has this to say of Belgium:

This small country, which all Europe beholds with admiration and respect for its important manufactures, for having the greatest number of railroad lines per square mile of any country in the world, and, finally, for being the only nation in the world that competes with England in every class of manufactures, and which has pushed public education to the height of perfection, has not overlooked bee culture. Hence it is that the government itself, as well as corporations and individuals lends great aid to the development of apicultural science by means of medals and other ways of stimulating effort; and this is the reason why, within a few years, Belgian apiculture has reached as high a point as in any other nation.

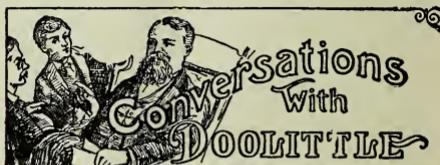
From the same source we learn that Switzerland is as far advanced in apiculture as any other nation. It has great bee-

keepers who may truthfully be called professors. Mr. Ed. Bertrand, in Nyon, publishes the *Revue Internationale*, one of the best bee-journals in the world [now discontinued]. In Switzerland the old-fashioned skeps are no longer known, for everybody has been converted to modern methods.

England has a large number of apiaries on the movable system; has several bee-journals and various bee keepers' associations. In fact, she stands among the great powers of Europe in regard to bee-keeping progress.

EL APICULTOR.

The first number of this fine Spanish bee-journal has reached us, dated Jan. 1. It seems to be the result of a disagreement between the managers of *El Colmenero Español*, another Spanish bee-journal. The journal in question is well printed, pages the same size as this. It contains a large amount of original matter, and is a great credit to the projectors of it. I am sorry to read in it of the death of D. E. de Mercader-Belloch, proprietor of *El Colmenero Español*, from which I have made translations above. Mr. Mercader-Belloch was well known in Europe as a bee-keeper, and was president of the Spanish Apicultural Society. He died on the 9th of December, aged 73 years. These two papers are published in Barcelona, Spain, and, so far as I know, are the only Spanish bee-papers published.



LONG HIVES VS. TIERING UP.

"Good evening, Mr. Doolittle. Fearfuly cold to-night outside."

"Yes. I think this will be the coldest night of the winter, so far. I see the mercury was ten degrees below zero just before dark. I always feel quite comfortable on such nights as this, when I think of the bees all safely housed in the cellar with the temperature always at forty-five in there. Always seems as if those outdoors would suffer on such nights, but perhaps they do not."

"I had not thought of it in that light. My 87 colonies are all out on their summer stands, well packed, and I was congratulating myself on this fact."

"Well, they may come out as well in the spring; but from an experience of over a quarter of a century, with bees wintered both ways, the underground cellar gives an advantage of fully 10 per cent on number of colonies successfully wintered, over what

chaff packing outside has done. But I mistrust that Mr. Jones did not come over to talk about wintering bees. What was on your mind to-night?"

"I have been thinking of making some long hives for next summer, and came over to have a little talk with you about the matter. Why do not those working for extracted honey use a long hive, holding the same number of frames that they wish to use in one story, instead of tiering up several hives, one on top of the other, as is advised by the bee books and papers?"

"I do not know just why others do not use long hives; but my experience with them was not in their favor."

"That is contrary to what I expected. From what thought I had given the matter I was of the opinion that a long hive would be more convenient, and that less time would be consumed in the manipulation of it."

"This matter was gone over quite largely years ago, and it might serve your purpose if I told you something regarding it."

"That is right; I shall be glad to hear."

"Some twenty-five or thirty years ago Mr. D. L. Adair, of Kentucky, was quite a prominent bee-keeper and writer for our bee-papers. He used and advocated a long hive, to be used on the principle of spreading frames out horizontally, instead of tiering one hive above the other, claiming that, thereby, a colony of bees could be kept in a normal condition, and while in said condition no swarming would be the result. This he termed the 'Long-idea' hive."

"Wait just a moment. Was he right in claiming that a colony which did not swarm was in a normal condition? I had always supposed that the colony which swarmed was in a normal condition. How else would bees, in a natural condition keep from becoming extinct?"

"My idea would run along the same way yours does; for in all my trials to prevent swarming, which have been many, colonies have to be thrown out of a normal condition in order to obtain success, unless a very large hive, filled with comb, is given. Where as much as 5000 cubic inches of drawn comb are given to a colony in early spring, few swarms will be the result; and I judge that Mr. Adair was cognizant of this fact, and for this reason he concluded that any colony, having to the number of from twenty to twenty-five Langstroth frames full of comb, was far more likely not to swarm than to swarm. therefore the colony which did not swarm while in one of his long-idea hives was in a normal condition."

"Excuse my breaking in. Go on with your story."

"Being always ready to test all 'new ideas' I made two hives, each four feet long, putting colonies in them, by setting the frames over from other hives, early the next spring. One of these I worked for extracted, and the other for comb honey, on the Adair plan. The one worked for comb

honey swarmed, soon after taking out one-third of the combs at either end of the hive, and substituting frames of sections, either because the 'idea' was faulty or because I did not know how to manage fully such a hive, or both; so after repeated trials to keep them at work in the four-foot hive I let them have their own way, and hived the swarm in a new hive after they had swarmed some five or six times."

"Just as I should have expected, after you took out two thirds of the combs, and put sections in their places. That is the way such a change always works with me, and I often wonder how others are still recommending such or a similar plan, of giving a top story of combs till the honey-flow arrives, and then substituting said story with a super of sections, claiming that the bees will at once go to work in them because they have been used to working 'up-stairs.' Unless this super is supplied with sections containing drawn combs it always results in swarming with me. What is your experience along this line?"

"The same as yours, unless something else is done by which the colony is thrown out of a normal condition. But we are wandering!"

"Yes, I see. Excuse me again. How about the colony worked for extracted honey?"

"That did splendidly, and did not swarm; but another, worked on the tiering-up plan, did nearly or quite as well; and by practical knowledge I learned that I could work a two, three, or four story hive much more easily than I could this long one."

"How was this? This part of easy working I thought was to be the best of all. If they are not as easily worked as the tiered-up hive, it shows that my opinion was faulty."

"To take the frames out of these long hives, the person's back must be bent just right, or enough to make it the hardest kind of work, unless the hives are set on stilts, which is not advisable; and the bees which are shaken off the combs will crawl all over the sides and top of the hive in such numbers as to make it almost impossible to close it again without taking much valuable time, or killing them by the score or hundred. With the two or three story hive, the bees shaken down at the entrance will not get up to the top story before you are through with your manipulation, and the operator can stand erect, or nearly so, while doing all the work."

"This is something that had not entered into my calculations, and I am quite surprised; but at the same time my reason tells me that you are right."

"But the worst thing about those hives was that I lost both colonies during the winter, and during every succeeding winter that I tried to winter bees in them. Of course, they were too unwieldy to carry into the cellar; but, so far as I could see, they were prepared for winter as well as any of the other hives which were left out, which

came through the winter in very good condition."

"How many years did you use these hives?"

"I tried them for several years, putting colonies from other hives in them each spring; as often as those left in during winter died, but with no better success than at first; and finally, becoming disgusted with them, I tore them to pieces and made the lumber into other hives."

"Then you think I had better not try such hives, do you?"

"Not on a large scale at first, at least. It will do no harm to try two or three as I did, till you are convinced for yourself. But I will say this: for my locality, and when working for extracted honey, I know of nothing better than using any of the ordinary hives two, three, and four stories high, according to the populousness of the colonies being worked."



The American Bee Journal has reintroduced the Question-box department under a new name—"Some Expert Opinion." The question asked is, "Would you use separators? If so, what kind, and why?" The responses are nearly all in favor of separators of some kind. The majority favor wood as against tin. Quite a number who have tested the fence separator like it and claim that the sections are better filled out.

OUR apologies are due to our subscribers for being late with our last issue—in fact, for several numbers back. The tremendous jump in our subscription-list has made it necessary for us to run our presses longer hours. In fact, we have been running all night to catch up. We are making plans for increasing our facilities, and hope ere long to get our journal out on time.

The American Bee Journal begins its 44th volume. It was founded by the lamented Samuel Wagner, and most ably edited by him for eight or ten years. When he died Langstroth assumed the management temporarily till it went into the hands of W. F. Clarke, who kept it for a couple of years when he sold out to Thos. G. Newman, who continued to be its publisher and editor up to the time the present proprietor took charge. With one exception the *Journal* has never failed to be on hand promptly, and that was during a strike last year in Chicago.

FOUR-PIECE SECTIONS.

It begins to appear that there are many friends of the four-piece section. It is argued that the extra time and cost of putting them together does not cut very much figure, because they can be put up by cheap help during the winter. The main argument in their favor seems to be that they will stay where they are put—that is, when pushed into a square position they will not try to assume the diamond shape.

PRIZES FOR PHOTOS OF BEE-SUBJECTS.

We particularly solicit fine photos showing any new idea or kink connected with the management of bees. For the best we will pay anywhere from \$1.00 to \$2.00, and even \$5.00 for some of extraordinary merit. The picture must be sharp and clear, and, wherever possible, be printed in red or pink tones, as these are best adapted to half-tone work. We can use black platino prints when the contrasts are sharp and the pictures are not printed too dark nor too light. They must, in fact, be just right.

We also request our correspondents, wherever practicable, to send us a rude pencil-sketch, or a model of the thing described, by mail. Our artist, Mr. Murray, will be able to work the rough sketches into first-class drawings. If you can't make a drawing yourself get some boy or girl out of the public schools to do the work for you. If the article or idea is acceptable we will pay for the drawing. Get the sketches anyhow; for as a rule we pay more for illustrated matter.

DEATH OF CAPT. J. E. HETHERINGTON.

It is with much regret that we record the death of one of the most extensive bee-keepers the world has ever known—a man who for a period of over 20 years actually kept and maintained more than 3000 colonies of bees. His son writes as follows:

Mr. Root:—My father, Captain Hetherington, died Dec. 31, after an illness of three weeks. He would have been 64 years old January 7.

Cherry Valley, N. Y. H. B. HETHERINGTON.

Since the above was in type the following has come to hand from P. H. Elwood:

Friend Root:—The closing hours of 1903 bereft us of our beloved Capt. Hetherington. To his family and intimate friends the loss is immeasurable. Among bee-keepers the one has fallen who for more than a generation has stood at the head of progressive, practical bee-keeping in this country. P. H. ELWOOD.

Starvville, N. Y., Jan. 9.

In our next issue we will have an extended biographical sketch of the captain, a man who has had a most remarkable career, both as an army officer, as a bee-keeper, and as an inventor. He was the first one to use super-springs, wired foundation, no-drip shipping-cases, the tall sections, etc., etc. The size he introduced was $3\frac{3}{4} \times 5$, which is practically the same as the 4×5 , which has begun to have such a large sale. He was a remarkable man in more ways than one, and the whole bee-keeping fraternity will much regret his death.

GLEANINGS FOR 1904; OUR INCREASING SUBSCRIPTION-LIST.

THE big boost we are getting in our subscription-list assures us that our efforts to give a good readable magazine are appreciated. Our subscription-list is now working toward the 17,000 mark. Just now we are printing 20,000 copies to take care of the demand for samples. So great has been the jump in our subscription-list that we have been compelled to advance our advertising rates in order to prevent our reading-columns from being swamped. As it is, we are putting in from 8 to 16 pages extra; and it now seems that GLEANINGS will have to be enlarged by at least 16 pages, making in all 52 pages, or 104 per month.

As in the past, we shall endeavor to give our readers matter carefully sifted, and easy to read. We believe in head-lines, lots of them, so that our friends can pick out just the information they desire most.

A strong feature of our journal for the coming year will be half-tone illustrations and zinc etchings. The average person can catch ideas at a glance through the medium of pictures, when he would not take the time to go through several columns of reading-matter that would require ten times the mental effort to get the same amount of information.

During the coming year there will be times when there will be less of illustrations and more Heads of Grain; and at other times there will be a preponderance of common articles. We sometimes get a surfeit of back matter for some particular department, and therefore give a larger proportion of some one department to equalize.

THE AMENDED CONSTITUTION OF THE NATIONAL.

ALL the amendments proposed by the committee at the Los Angeles convention, to the constitution of the National, have been carried. Two of the most important changes are as follows:

The General Manager, President, Vice-presidents, and Secretary, shall be elected by ballot in November of each year, by a *plurality* vote. The old constitution provided that the General Manager and Directors should be elected by a *majority* vote of all votes cast. Whenever there were several candidates for one office, it made it practically impossible to secure an election, because there would not be time to call for another vote within the limits prescribed. The constitution as now amended does away with this by making an election based on a plurality vote—in other words, the one receiving the highest number of votes will be elected. Formerly, too, the President, Vice-presidents, and Secretary, wereelected at the regular annual meetings. As a natural result, they were the selection of a local and not of the entire membership.

Then there is another important change in the matter of new amendments. The constitution as amended provides that it

may be amended by a majority vote of all the members voting, providing that such proposed amendments have been approved by a majority vote of the members present at the last annual meeting, and providing that copies of them shall have been mailed to each member at least 45 days before each annual election. If such a provision had been in force, in the old constitution some of the complications that have arisen in the past would have been avoided.

THE NATIONAL ELECTION; A TRAINLOAD OF HONEY 25 MILES LONG.

GENERAL MANAGER N. E. FRANCE, by a large majority, was re-elected; this was a foregone conclusion. For Directors, R. C. Aikin, and P. H. Elwood, were elected, and E. R. Root holds over. For the amendments there were 491 votes, and 10 against. By a provision of the old constitution, it was necessary to have a *majority* of all votes cast to declare an election. By another provision, the old officer hold over until his successor is elected and qualified.

A short time ago I announced to the public that I could not be a candidate for re-election, and would be compelled to resign if elected. The vote shows that W. McEvoy received 268 votes while I received 195. The number of votes necessary to declare an election was 277, which is just one more than half of all the votes cast. According to this, Mr. McEvoy lacked just 9 votes of being elected. The Chairman of the Board of Directors, therefore, declares that, no one having received a majority vote of all the members voting, E. R. Root will hold over as provided by the constitution under which this election was held.

In accordance with a previous declaration made by me, to the effect that I could not serve if elected again, I have sent in my resignation as a member of the Board, to the Executive Committee, of which J. U. Harris is chairman.

I regret very much the necessity of taking this step; but pressure of other work—and that means too many irons in the fire—as well as some private reasons, makes this course unavoidable; but in saying this I wish to state, as I have done before, that my relations with the officers of the National—in fact, with all of its members—have been very pleasant; but I believe I can work as well for the Association in the rank and file as I can among the officers. I expect, as before, to put the whole influence of GLEANINGS back of the Association, as far as I am able. I believe it is the best-managed organization, in the interests of the bee keeper, that exists in the world; and I am not sure but it has the largest membership. Certainly no other bee-keepers' society whatsever exerts so wide and extended an influence as the National Bee-keepers' Association of the United States, and it has only just begun its splendid career. When one can secure all the benefits by joining through his local association, for the pa

sum of 50 cents, and fails to do so, well—er, yes—I feel sorry for him. Sorry for him that he won't join for his own sake, and sorry that he can't or doesn't see that the organization stands for the good of the bee-keeping interests in the *greatest bee country in the world*, a country that produces annually such an enormous output of honey that, if it were loaded on cars, it would make a trainload 25 miles long.

CONTRACTING THE ENTRANCE FOR OUT-DOOR-WINTERED BEES.

THOSE who winter out of doors would do well to have the entrances of all their colonies contracted down to very close quarters during zero weather—say $\frac{3}{8} \times 2$ inches; but as soon as it warms up a little they should have almost the full width—say $\frac{3}{8} \times 8$ inches. It should again be contracted at the approach of a cold snap.

Two years ago, for the purpose of experiment, we left some colonies with their entrances $\frac{1}{2}$ by the whole width of the hive, and others $\frac{3}{8} \times 8$ wide. The ones with the wide and deep entrances either died outright or came through in very weak condition, while those with narrow entrances came through in good order.

During the very coldest weather, the bees require but very little ventilation; and the smaller the entrance, up to a reasonable limit, the eas'er it will be for the bees to warm the cubic capacity. A large entrance is like an open door or window to a house—too much draft, too much cold air. It may take a little extra time to open and contract the entrances, but it will be time well spent. While opening up the entrances, be sure to rake out any dead bees that may have accumulated in the empty space.

In milder climates where the temperature does not go lower than 25° above zero except for a day or two the entrances will not need to be changed. Contract at the beginning of winter to an opening not larger than $\frac{3}{8} \times 6$ inches, and leave it at that all winter.

THE CROSSEST BEES.

MR. O. M. BLANTON, in the *American Bee-keeper* for January, in writing on the subject of the best honey-gatherers, is satisfied that there is but very little difference in the various strains of bees. The Cyprians, he considers, are the most vicious; and then come the Holy Lands, the Italians crossed with blacks, and then Carniolans. The last he thinks very easy to control. He then adds: "I see no advantage in Cyprians at honey-gathering; and it is the height of folly to suffer such torture from them without any remuneration. The Cyprians whipped me out on several occasions while I was endeavoring to remove the surplus honey. Tobacco and even sulphur could scarcely control them when the smoke was comparatively cool." When we were furnishing the Cyprians it was our experience and that of our customers that they

were by all odds the most vicious bees to handle. Smoke, on many occasions, seemed to have absolutely no effect on them. We were not surprised on removing the cover of a hive of them to have hundreds and hundreds of them dart out, and sting the moment they struck us. On one occasion I remember that one of our new bee men, not understanding them, and not having been cautioned, stirred up a mess, the like of which I hope never to see again. If one can imagine a swarm of bees, every one of which is bent on stinging, he can get some idea of what I saw in the yard that morning. It seemed as if nearly every bee had deserted the hive to attack the supposed enemy. I had no more than got into the yard than I had to beat a hasty retreat. We had to kill the queen finally.

It is fair to say that not all Cyprians were as cross as these; but even the gentlest of them were disagreeable to handle.

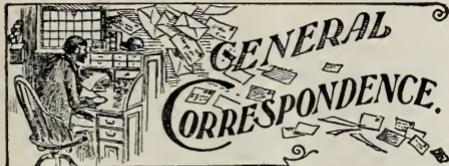
WHY OUTDOOR-WINTERED BEES DIE DURING LONG-CONTINUED COLD SNAPS.

WE have been having unusually cold weather, beginning about the middle of November, and letting up a little this morning, Jan. 8, when it is thawing a little. Much of the time the mercury has been playing very closely around zero, and a great deal of the time we have had high winds. These are trying times for outdoor-wintered bees, and why? During very cold weather the bees will draw up into a very small cluster, and they will remain in this bunch, closely compacted, as long as it continues to be very cold. If no warm spell comes on, giving them a chance to move over and seek a new spot from which they have eaten the honey all out, they will be liable to starve to death. After a very cold snap I have gone over some of our outdoor colonies, and found little bunches of bees dead. The honey had been eaten away from the cluster for perhaps two inches all around. They had contracted into a small bunch until the honey was out of reach. A few stray bees will always be found that have left the cluster in the effort to get food but chilled to death. It was too cold for the cluster to move, and hence it starved to death.

It has been stated that the cluster will move during cold weather; but I have never had the evidence of it; but I have seen the outside bees on the cluster stiff and cold, but still showing signs of life.

This warm spell that has just come on, even if it lasts for only a day, will give the bees a chance to get over to one side to get on the honey again, with the result that they are ready for another cold snap.

In very cold winters the indoor plan is certainly much to be preferred. In all climates, while the thermometer remains below the freezing-point during most of the winter the indoor method will be somewhat more economical of stores, and furnish stronger and healthier bees for the following spring.



A VISIT TO THE APIARY OF MR. E. E. STARKEY, EVANSTON, ILL.

Some Ideas which may Serve as Suggestions.

BY H. H. ROOT.

[Huber, or H. H., is the youngest member of The A. I. Root Co. While attending the Northwestern University, near Chicago, he visited Mr. Starkey. At that time he took several photos which are here reproduced.—ED.]

A few weeks ago I had the opportunity of looking over Mr. E. E. Starkey's yard. Some of his ideas interested me so much that I asked permission to illustrate them for GLEANINGS.

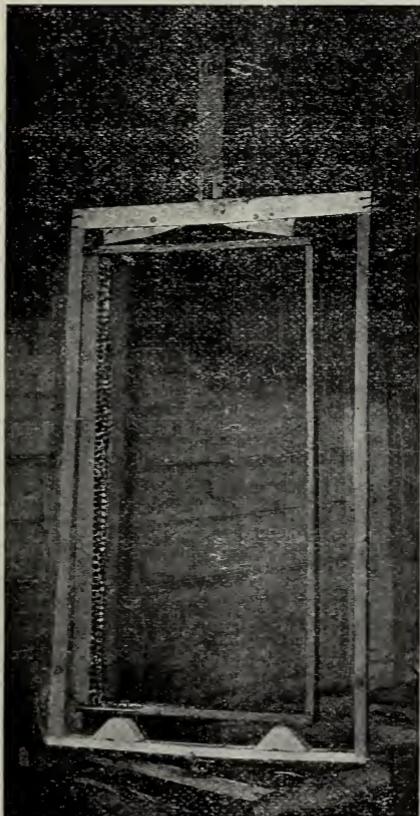


FIG. 1.—STARKEY'S UNCAPPING - FRAME HOLDER.

A HANDY DEVICE TO HOLD FRAMES WHILE UNCAPPING.

The first thing that caught my attention in his workshop was a sort of frame pivoted at the bottom, and hung by a spring from the ceiling (see Fig. 1). This proved to be

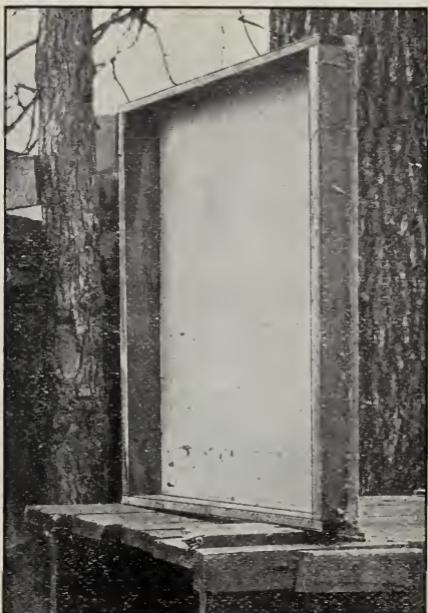


FIG. 2.—STARKEY'S CLOTH HIVE-COVER.

a device for holding the frames while uncapping. A glance at the illustration will make the idea clear.

With one hand the upright stick or handle above the frame is grasped and pulled downward. This raises the two points on the ends of the pieces attached to the handle; and when the comb is placed in the holder upon the two lower points the tension of the spring from the ceiling above pulls up on the handle, thus lowering the two upper points and tightly clamping the comb. This seems like a complicated apparatus for so small an operation; but a trial would convince any one that it is a good idea. The material costs only a few cents, and the whole thing could be made in an hour's time. I myself tried placing a frame of comb in the holder, and it was just like handing it to some one to hold for me, for the iron points immediately clutched the frame and held it firmly. Then when I wished to take it out a slight pull on the handle released it. This device will, of course, turn round, allowing each side of the comb to be uncapped; and it will also tip down or back in order that the honey and cappings may drop away from the comb into the pan beneath.

A CHEAP BUT EFFECTIVE COVER.

On going outside the workshop I noticed that the hives had a rather peculiar cover. Upon examining one of them I found that it consisted of merely a frame upon which was tacked a piece of canvas (see Fig. 2). This canvas, after being stretched on the frame, is then dipped in a solution of beeswax and resin, making it perfectly watertight. It was so simple that my first thought was that it must be good for nothing; but after being told that over fifty had been in constant use, I changed my mind somewhat. In summer it is obvious that, with but one thickness of canvas to shield them from the sun, the bees would become too warm; therefore a small shade-board of thin wood is placed on top, and separated from the canvas by two cleats, thus making a ventilated cover. In winter Mr. Starkey packs his hives in such a way that the bees are kept warm.

While I would not recommend this cover as described, I think that it is a valuable suggestion. Just now, when the price of lumber is increasing so rapidly, why would it not be a good plan to make our hive-covers of the cheapest of wood in narrow pieces, and then add a thickness of canvas which may be dipped in some such preparation as will make it water-proof? In this way a cheap cover could be obtained which would neither warp, twist, nor leak. This method is already used with good success in Colorado; but the canvas is painted instead of being dipped in the beeswax and resin.

WINTERING BEES IN OUTSIDE SHELTER.

Although the form of packing bees for

winter, as shown in Fig. 3, is old, yet I think it deserves mention. Fifty-six colonies are thus placed together, packed with leaves, and the whole covered with a cheap roof of tar-paper. Later in the year a load of hay will be spread around on top after a few boards have been arranged in such a way as to give ventilation.

In the foreground of Fig. 3 will be noticed a white tool-stand which holds every thing from smoker to tacks. On one end of this, as shown, are two projections which will hold two frames of bees. This is a very handy arrangement, for it does away with standing frames on the ground about the hives.

THE OYSTER-PAUL AS A HONEY-PACKAGE.

The idea about the yard which interested me most was Mr. Starkey's method of putting up his extracted honey; in fact, I was so much interested in it that I myself have been experimenting for several weeks with this same idea, which consists in putting up the honey in the ordinary oyster-pail. I am well aware of the fact that this has been tried before; but I do not believe it has been thoroughly tried in a community where people are looking for candied honey. The general plan is similar to that used by Mr. Aikin, the honey being poured into the paper packages and allowed to candy. Fig. 5 shows a crate of the honey in the oyster pails, candied solid, and ready for market. After this stage has been reached, the cardboard can be cut down one side, and the whole peeled off, leaving a form as shown in Fig. 6. It seems to me that honey on a plate in this

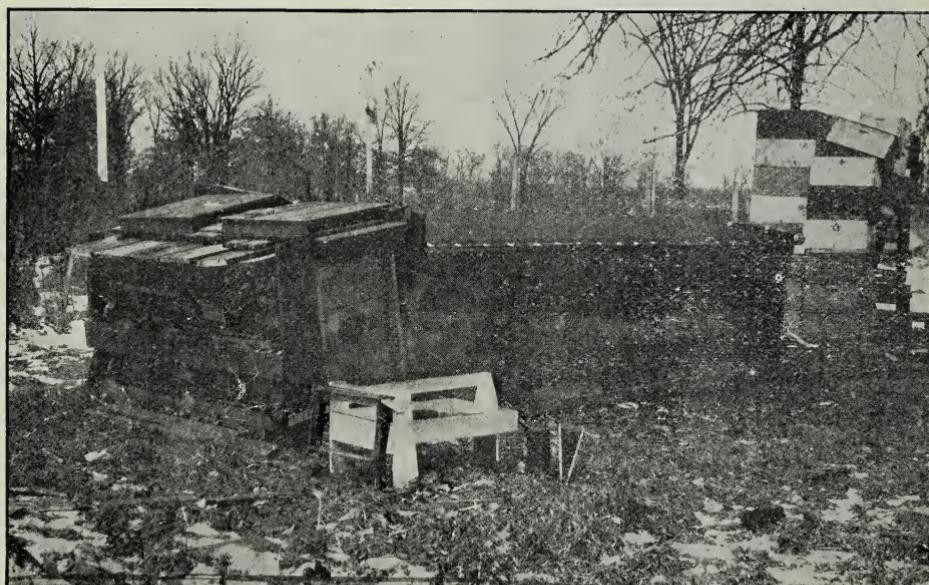


FIG. 3.—HIVES WINTER-PACKED UNDER SHEDS ; TOOL-STAND AND SEAT IN THE FOREGROUND.

form is much more artistic and pleasing to the eye than the cylindrical form which comes from the Aikin honey-bag. A mere sight of a plate of this candied honey would insure a sale. It looks like a small mound of frozen cream.

From my observations and experiments I have come to the conclusion that the oyster-

oyster-pails with thin warm honey, and I have yet to find one that leaked. It is impossible for them to leak unless they are tipped over. There were objections to the Aikin honey-bag because of the difficulty in handling after being filled with liquid honey; but in this form of package this objection is entirely overcome. To illustrate

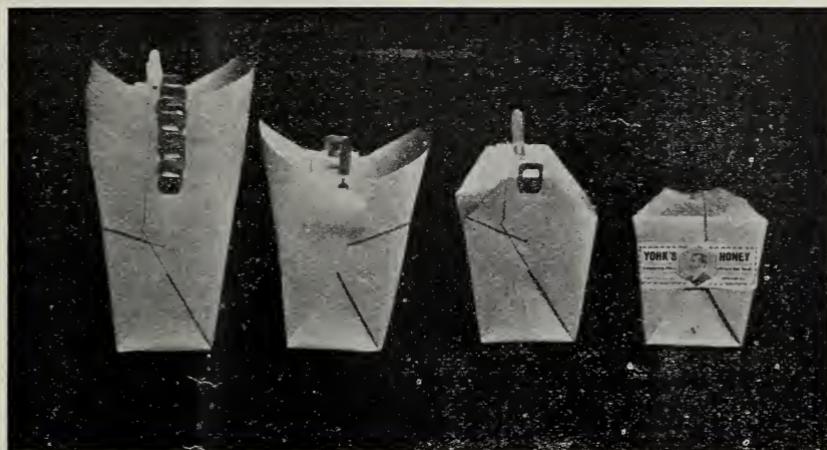


FIG. 4.—OYSTER-PAIls USED BY MR. STARKEY FOR PUTTING UP EXTRACTED HONEY.

pail possesses many advantages over the Aikin honey-bag, aside from general appearances. In the first place, they may be obtained at any grocery for about 75 cents a hundred; and since they need no paraffining whatever this first cost is the total cost. They come nested like berry-boxes, as shown in Fig. 4. All that is necessary to do in filling these packages is to separate them one by one from the pack, and pour in the honey. There is absolutely no

the strength of these packages, and to show how easily they may be handled, I might tell about a few experiments which I performed. After filling the pint size with one pound of honey, and folding down the top of the package, as shown in Fig. 4, I dropped it five times on a hard floor from a height of five feet. The fifth time a slight crack appeared at one corner. I made no effort to drop it squarely, for in some cases it tipped over entirely; but I picked it up before the honey could leak through the

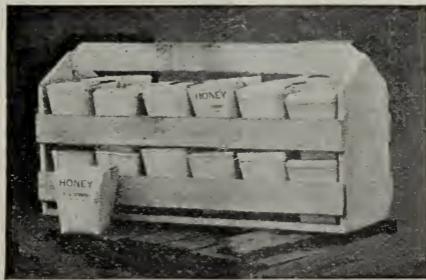


FIG. 5.—STARKEY'S CRATE OF OYSTER-PAIls FILLED WITH CANDIED HONEY.

trouble in performing this operation, as the packages do not have to be formed, but are simply set in a row ready for filling. After being filled they can be carried about by the handle, and moved with perfect safety. I have filled large numbers of these



FIG. 6.—A PLATE OF CANDIED HONEY AS IT COMES FROM AN OYSTER-PAI.

cracks in the cover. Then I threw it fifteen feet into the air, and caught it when it came down, without breaking it, or spilling the honey. I next tried the experiment of carrying a pound of honey with me when I went home. I had to run half a block to

catch a car going at full speed, then walked half a mile and rode in a crowded train. During the whole trip I carried the pound of honey in my hand with no inconvenience whatever. Lastly, I shipped six packages of the liquid honey a distance of two hundred miles by express. They were placed in an ordinary basket with a little packing underneath and around the sides, and with a paper tied over the top. There being no caution-marks to indicate the contents, the honey was subjected to all the ordinary rough handling by the expressmen. Each package stood the test in good condition.

These results have led me to think that the liquid honey might be sold in the oyster-pail as well as oysters.

HOW TO HASTEN THE CANDYING OF HONEY.

I have not yet satisfied myself as to what will hasten the crystallization or candying of honey. Although it is true that some kinds of honey candy much more readily than others, yet that which affects the candying of one kind of honey would also affect any other kind in the same way. It is clear that a very thin layer of honey will candy much more readily than the same amount in a thick layer, which fact would prove that the honey having the greatest amount of surface exposed to the air will candy first. Acting on this theory there are many who believe that stirring hastens candying because it introduces more air in the form of minute bubbles throughout the mass; but in my experiments on a small scale, the bubbles of air have all risen to the top in the form of a scum, and the honey has candied no more quickly than that which was not stirred. However, since my tests were relatively small it is possible that I have overlooked some important fact. Some have said that a few crystals of candied honey added to the liquid honey will hasten the crystallization of the whole mass, and in my experiments this has seemed to be a fact. Probably it is sufficiently well understood that a man must create a market for candied honey before he can sell enough to make it pay; but once his market is established, he need worry but little about keeping it up. When people learn to eat honey in the candied state they will demand it in that form and in no other. I think that, in the near future, there will be three great classes of honey instead of two; viz., comb, extracted, and candied. Perhaps, too, in time bulk comb honey will form a fourth class. At any rate, we should be eager to improve our methods, not only by adopting shorter cuts but by putting our product in the forms that will please the people of all "localities."

COGGSHALL'S SMOKER FUEL.

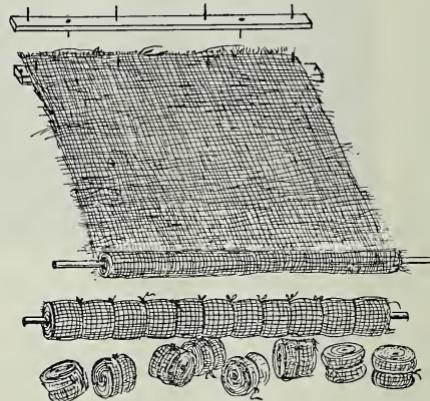
How Prepared.

BY W. L. COGGSHALL.

For the benefit of those who have written me and have not received a prompt reply, I will say I hope they will excuse me, as I

have a farm and some bees and men to look after. More have inquired about smoker fuel than any thing else of late. Some old phosphate sack ($\frac{1}{2}$ lb.) and a dime's worth of saltpeter is all the fuel I need in an apiary of 100 colonies in one season.

First lay the sacks out till they get a little rotten (three months); then drive four wire nails through a one-inch strip about ten inches apart. Now nail that to the opposite side of a work-bench, four nails sticking up. Get a ball or two of cotton twine, not the best. Wind it on a half-inch board, 5×20. Wind the short way around, and the whole length. Now nail another one on it, and nail it to the side of the bench. After cutting all those wound strings on the edge of the board you will



have a quantity of short strings to tie around the sacking after it is rolled up. With an assistant, hook the sack over four nails lengthwise of the sack. Take a half-inch rod and roll up the sack, not too tight, but just right. Your experience will tell you better than I can. Unhook the sack, and, with the strings all cut, tie every four inches. After all is tied up, take an ax and let one man hold the rolls while the other chops them off between the strings. Dissolve 2 lbs. of saltpeter, just as strong as it can be. Put it in a pan one inch deep. Sprinkle in a little red lead. Now dip one end of those wads into the saltpeter water, then throw them in a pile to dry. The red will tell you which end to light.

The beauty of it is, you will have a smoke in ten seconds that will do business, and it is light in weight in the smoker—no sparks, and it will last three to eight hours with light work with bees, and never go out if the material is all right.

I do not expect to convince the world I am always right, and have the best things of the kind. You who try it will not be saying, "The smoker is out; I wish I had some good smoke. Then I would fix those crazy rascals." But you may have to break the string on the wad if you tie too tight. Do not

use too much smoke. A little is better than too much—yes, far better. Remember that too much smoke makes cross bees.

Do not forget to flip-flap the oilcloth when you puff a little smoke in. This alone is why oilcloth is better than a board.

West Groton, N. Y.

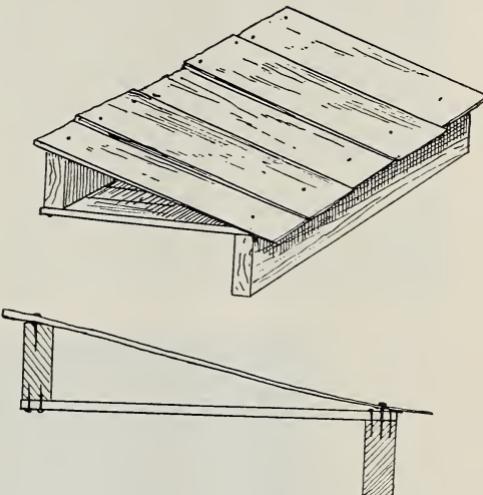
THE KEYES (SWARTHMORE) METHOD OF FERTILIZING QUEENS.

A Cheap Home-made Feeder and Hive-cover.

BY W. S. BLAISDELL.

I hereby submit my report of experimenting in the line of the Keyes method. It works satisfactorily under only two conditions—a queenless colony and one when they desire to supersede their queen. But this makes practically a failure. I have tried only the full-size frame. But I went further. I could not see the purpose of the communication from the nucleus to the brood-nest, and I closed them up so far as I had gone in opening them. After that I had no trouble whatever, more than in an ordinary three-frame nucleus. With this change it makes an admirable device. The sides are loosely made and fastened on. A case of hatching brood can be taken from the brood-nest, a matured cell given them; the fertilized queen can be taken out, and

But stimulative feeding is necessary in all queen-rearing undertakings; hence my device for nucleus feeder: Take two empty corned-beef cans, small size; slit down from the top of one $1\frac{1}{2}$ inches long by $\frac{3}{8}$ deep, turning the lip down on the outside. Then take the other can, and in the side of the reverse end cut a slot the same size as the opening, and remove the core. Now insert

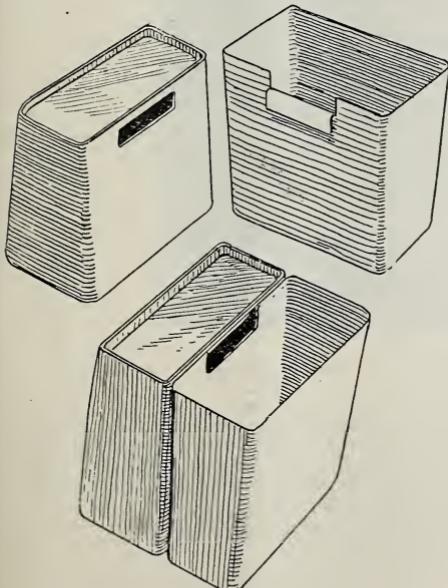


BLAISDELL'S SHADE BOARD AND HIVE-COVER.

the lip of the one in the slot, and you have the two joined. Fill the one with feed, and put a few floats to bridge a passage up and down, and cover both with cloth to prevent odor, and a weight to keep it close. Then place the inverted side over a half-inch hole in the cover.

Again, while I have my pen in hand let me give you what I may call a poor man's perfect cover. I got tired of handling separate shades, hence my contrivance. I do not want my bees near tree or brush or grapevine, except what I myself put out for the swarms to cluster on. Take three or four or five inch flooring, and cut it up into sections 15 inches long (mine are), depending on the width of hive. Put these together the length of your hive. Now take a 1×3 , the exact length of the cover; nail on the rough surface across the ends, one nail in each piece and two in the end-pieces. Take another 1×3 , and nail on the reverse side across the opposite ends. The dressed side goes down, the rough up.

Now take shingles or shacks and cover the rough side—18-inch shingles project over mine a little, both on the upper and lower sides. I shall use 20-inch shacks when I can get them. This cover has stood the test under the burning suns and whirling tornadoes of Florida. There is no more ripping-off of shades under the stormy blast. Without any other protection I have



BLAISDELL'S FEEDER FROM CORN-BEEF CANS.

the frame of bees given back to the brood-nest, and no loss will be felt. Or two queens can be reared before the bees get too old to do good work.

yet to find a single breakdown from the heat, and my frames are not wired.

Victoria, Fla., Aug. 31.

MR. FARMER, THE BEE KEEPER AND CANDY-MAKER.

BY ARTHUR C. MILLER.

If you would know an enthusiastic bee-keeper, just make the acquaintance of Frank H. Farmer, of Boston and Littleton, Mass. He is both a beginner and a veteran. He began bee-keeping only a few years ago; but in the short time he has been at it he has advanced with wonderful rapidity, and now is better versed than many a man who has grown gray in the business.

Personally Mr. Farmer is a wiry, active young man, clear-eyed and alert; in a word, a "hustler." Affable and of pleasing manner, he wins one's good will from the start. Mr. Farmer's business is that of candy-manufacturer. As a recreation he took up bee culture, and rapidly worked

in almost as many kinds and styles of hives. Let not the veteran hold up his hands in horror, for this very mixture of hives is of vital importance to Mr. Farmer, enabling him to form valuable opinions as to the merits of types of hives and systems of management, and to advise wisely his many patrons.

He is having a cellar built for wintering uses that he may compare that system with outdoor methods. He is also soon to erect a roomy building for use as an extracting-house, workshop, etc.

The Littleton apiary is on a pleasant hillside well up toward the top. If one may judge from the crops he secures, both in quantity and quality, the location is rather above the average for New England. Besides the Littleton apiary Mr. Farmer has scattered here and there, for twenty miles around, groups of from two to six colonies so that he may get a fuller knowledge of the honey resources of Eastern Massachusetts. He is leaving no stone unturned to make himself a master of bee-keeping.



FARMER'S APIARY IN THE REAR OF HIS CANDY-STORE. SEE GLEANINGS, LAST ISSUE, PAGE 16.

into the business of selling bees, honey, and supplies. One floor of the building he occupies in Boston is devoted to the bee-supply trade, and during the spring and summer it is a busy spot. That he may not be separated from his bees, and also that he may have bees and queens handy for immediate satisfaction of all urgent demands, he has established an apiary on a long balcony just outside his factory windows. A picture of part of it is shown herewith. Mr. Farmer stands holding a placard, and at his left is Dr. Holmes, an enthusiastic amateur of Randolph, Mass.

Mr. Farmer's main apiary is at Littleton, Mass., where he has some 50 or 60 colonies

Thoroughness seems characteristic of the man. To meet him is a pleasure; to know him more intimately is an inspiration. Let no bee-keeper visiting Boston fail to call on him at his office, 182 Friend St., where a most royal welcome awaits them all.

Providence, R. I.

[As noticed in our last issue, page 16, I visited Mr. Farmer a few weeks ago. I think I never before saw one more enthusiastic on the subject of bees, and it is indeed, as Mr. Miller says, an inspiration to meet him. While in one sense of the word he is an amateur (I mean an expert, one who loves the art he is studying for the sport of

it), he is also in business for the money there is in it. For the length of time he has been studying bees it would be hard to find one who is better posted in all that pertains to the study of the little bee.—ED.]

THE FORMATION OF NECTAR.

Translated from the French by Frank Benton, U. S.
Department of Agriculture, Washington, D. C.

BY DR. MARCEL MIRANDE,
Laureate of the Institute of France.

[The clear and instructive article following this note was presented by Dr. Marcel Mirande before the Apicultural Society of Savoy, France. Dr. Mirande is a recognized authority in plant physiology, and his views are, therefore, well worthy of consideration. The article was published in the *Revue Internationale d'Apiculture*, Vol. XXV., No. 10, for October, 1903. Upon a careful perusal of it a number of interesting and practical features suggest themselves at once.

First.—The occurrence of real honey dew direct from the plants without the intermediary of aphids or plant-lice has often been questioned, and few writers on apiculture have been disposed to admit that such production takes place. My own observations placed me

comprehend somewhat better the prerequisite conditions for nectar secretion. Further, the suggestion comes naturally that the nectar-secretion of many cultivated crops which are not ordinarily irrigated might, under certain conditions be greatly increased through irrigation. Even in some countries where the rainfall is not deficient, irrigation of certain crops is practiced to increase the farmer's returns. The U. S. Department of Agriculture has considered this feature of the irrigation question as of sufficient importance to warrant the sending of an expert to Italy, one of the countries in this category, to study the subject of the benefits from irrigation in regions not deficient in normal rainfall.

Third.—Frequent light cultivation of crops—that is, keeping the surface broken and pulverized—draws moisture to the surface and increases deposition. This is, then, in a measure, a substitute for irrigation or rainfall, and as such would in the same manner increase nectar-production by the plant. It follows naturally that plants producing nectar when growing wild, would, under cultivation, increase their yield. Here, then, is a factor which should come largely into any consideration of the question of increasing pastureage for bees through the cultivation of special crops.—TRANSLATOR'S NOTE.]

Green! This is the color upon whose infinite chromatic scale our eye rests when viewing carpeted meadows, the foliage of woods, or the somber background of pine forests. Monotony! a morose spirit would



FARMER'S EXHIBIT OF BEE-KEEPERS' SUPPLIES.

long ago on the affirmative side of this question, and in my manual,* the first edition of which was published in 1896, I said on page 38:

Under peculiar conditions of the atmosphere, sweet exudations, also known as honey-dew, drop from the leaves of certain plants, and are eagerly taken up by the bees. This substance is sometimes very abundant and of excellent quality. It should not, however, be confounded with the secretions of extra-floral glands such as are possessed by the cow-pea, horse-bean, partridge-pea, and vetches. These seem to be natural productions for the purpose of attracting insects to the plants, while the former is apparently an accidental exudation through the plant-pores, brought about, very likely, by some sudden change of temperature. Both are, however, merely the saccharine juices of the plant, and when refined by the bees may become very excellent honey.

Second.—We understand from Dr. Mirande's explanation of the manner in which nectar is produced how it is that plants subjected to irrigation often produce such wonderful yields of nectar. In fact, we begin to

say; marvelous charm, harmony! would exclaim the poet, who sees in this fresh coloration the happiest transition from the dull and dark color of the earth to the blue of the heavens, a background upon which flowers of various tints, and the red or golden fruits which succeed them, stand out sharply. He would sing the richness of tones that Nature, with her brush, finds in green for the ideal picture that she offers us.

But here comes Science. Will she be in accord with Poetry? Whilst the latter exclaims with enthusiasm, the former casts at you a cold, barbarous word, the word *chlorophyll*, by which term she designates the coloring-matter of leaves. She explains to you, in the language of chemistry, near-

* Bulletin No. 1, n. s., Division of Entomology, U. S. Department of Agriculture. "The Honey-bee: a Manual of Instruction in Apiculture." First edition, 1896.

ly sibylline, the composition of this matter, and in the severe style of physiology she relates to you its important *role*. We will see, however, that Poetry can gain by her alliance with Science only when she celebrates the beauties of nature, which she embellishes and enlarges by the luminous clearness of truth.

Let me, then, dear reader and bee-friend, say something about chlorophyll, although at first view this subject seems to have little in common with the title of this discussion. But I hope to satisfy your impatience quickly, and reach in this manner a discussion of the nectar of flowers.

If a thin section made with a razor across a plant leaf is examined under the microscope, there may be seen in the interior of the cells which compose the framework of this organ, a large number of small green corpuscles. It is the innumerable aggregation of these corpuscles which gives to the leaf its general tint. Each one of them is a fragment of living matter impregnated with a green pigment which the chemist has been able to isolate and which he calls chlorophyll. These microscopic organisms are the agents of a marvelous phenomenon to which we will call attention in a few words.

Everybody knows that plants breathe; they absorb by means of small openings, or stomata, with which the surface is covered, the air which is to furnish to the plant the oxygen necessary to every living being. But this air brings also to the plant carbon, a mineral absolutely indispensable likewise to life, and which constitutes even the larger part of the weight of the plant. This air is charged with carbonic acid, which, having reached the living plant cell, is decomposed into its constituent elements, carbon and oxygen. The carbon remains in the plant, incorporated into its living matter, while the oxygen is freed.

But in the plant how is this decomposition of the carbonic acid brought about, this reduction, as the chemists say, the initial phenomenon in the assimilation of the carbon? To accomplish in his laboratory such a reduction the chemist is obliged to develop in his crucibles an enormous temperature. But the plant-cell is a differently constructed laboratory where, without noise, and without appreciable heat, this reduction of carbonic acid is effected by means of a very singular agency, which is no other than the corpuscle of chlorophyll of which we have spoken above.

These corpuscles, in fact, grouped in the plant-cell one next to the other, form a compact green screen interposed among the rays of sunlight and the living matter of the cell.

In the same manner as a red or blue pane of glass placed between our eyes and the white light of the sun transmits only the blue or red rays which constitute this white light, and absorbs the others, so this green chlorophyllian screen absorbs a large part of the solar radiation, permitting only the green rays to be transmitted. In these ra-

diations the luminous rays are the ones which strike more particularly our senses. But along with these luminous rays, others are found: the heat rays, up to a certain point perceptible to our senses; also the chemical rays, which we can perceive only by the effects they produce. It is in this manner, for example, that light acts on a photographic plate though its chemical rays, which decompose, that is to say, reduce, the salts of silver with which the plate is charged; and it is this radiation which figures on the plate the picture of the objects as a silver pencil would do it. The radiation effected by the screen of chlorophyll is likewise the source of chemical energy, which, in the plant-cell, reduces the carbonic acid; as soon as this reduction is brought about, the carbon is incorporated into the living matter.

But the force of the radiations absorbed through the chlorophyllian screen is not employed solely in decomposing the carbonic acid. It serves also to vaporize a large quantity of water which circulates within the plant, drawn constantly from the soil by its roots.

Every one knows that plants transpire, that is to say, that they give off continually water-vapor. Transpiration is a general phenomenon with plants; it takes place both by night and by day. But with those plants which have green matter this phenomenon is increased by the vaporization due to the chlorophyll, and this, therefore, takes place only during the day.

Chlorovaporation is the name which has been given to this particular phenomenon which adds its effects to ordinary transpiration so as to increase the latter to a very considerable degree. Ordinary transpiration alone, in fact even accelerated by the heat of the day, comprises only a small part of the total vaporization. Thus, for a hundred grams of water exuded by a single wheat-plant, hardly three or four grams are due to ordinary transpiration; a field of cabbages where the plants are set at 50 centimeters, 19.685 (or nearly 20) inches, gives off per hectare 2.471 (or nearly 2½) acres, under the complete influence of this phenomenon during the twelve hours of the day, the enormous figure of 20,000 kilogrammes (44,092 lbs.) of water. Imagine the prodigious quantity which is constantly poured into the atmosphere from the meadows and forests! This surprising effect, produced by such a slight cause, chlorophyll, balances the absorption by the roots and keeps up the continual current of water necessary to the plant.

Every evening, as soon as the sun is below the horizon, chlorovaporation slackens, then stops, whilst the absorption of water by the roots continues. This, then, occurring without being balanced through vaporization, results in the internal pressure becoming more and more intense. A time arrives when this pressure is too strong, and the water escapes from the plant. This is the phenomenon of exudation, or of *chloro-*

sudation, in order to indicate its origin. Sometimes this exudation occurs by means of special orifices, the water-bearing stomata; very often it takes place simply through slits and through slight lacerations brought about on the surface of various parts of the plants. It is through a slit produced at the tips of meadow grasses that the water escapes in successive droplets, mistaken sometimes for dew. In the morning the sun shines on these droplets with a play of sparkling light which everybody has admired.

Very frequently the exuded liquid escapes directly from the plant through its epidermis. Many times the water, before running out in very fine drops, has been obliged to pass through portions of the tissues in which the plant has collected for its use reserve materials, sugar principally. In this case the exuded liquid is sweetened, and this is what is commonly called nectar—the nectar which greedy insects come and gather, and which bees carry to their hives to make into honey. The portion of the body of the plant where the sweetened reserve is stored up is dissolved by the water which passes through it, and constitutes what is called a nectary.

Nothing is more variable than the form of the nectaries and their position on different plants; a special chapter would be needed to give a full review of these organs. In the case of the ferns, on the elder, on the vetches of our fields, on the almond and the plum tree, the nectaries are found on the leaves. But it is particularly in the flower, whose parts are in reality only transformed leaves, that nectaries are found in the most diverse forms and positions.

But for the present let us bear in mind only this single important fact: The production of nectar is due to chlorosudation, a phenomenon due itself to the slackening of chlorovaporization. Chlorovaporization varies in intensity with the conditions of the exterior medium: temperature, hygroscopic condition of the air, wind, etc. By modifying these conditions, plants which were not nectar-bearing have been made so, and reciprocally the pouring-out of the sweetened liquid from plants furnished with the nectaries has been suppressed. The conclusion from this is that it is to chlorophyll that we owe honey-production. Chlorophyll, then, is what starts into action all those forces which result in the sweet harvest with which our hives are filled. But this is the least of the benefactions which we owe to this green substance. We owe our lives to it.

Yes, our lives! The plant, in fact, fixed in the soil, draws from this soil the mineral elements with which it makes living substances perfect in all parts. The roots bring to the plant phosphorous, azote (or nitrogen), and various minerals. The leaves give it oxygen from the air, and there is lacking in this combination only the principal body, carbon, without which the plant is reduced to parasitism. The chlorophyl-

lian corpuscle, through the admirably simple mechanism of which we have given above a rapid sketch, is the assimilative agent for this indispensable substance. Of all living beings, plants alone are those which make living matter by means of purely mineral elements. Animals themselves can be nourished only from living matter; this matter they take from the object which makes it, from the plant directly, in case they are herbivorous; or indirectly if they are flesh consumers. The plant kingdom, then, is the bond which unites the inanimate kingdom with the animal kingdom. Human life is, therefore, dependent upon plant life, which, it might be remarked, places agriculture in the first rank among social labors. But as the plant in turn exists only through the operation of chlorophyll, and this operation is due to solar energy, it is seen at last that the sun is the source of all life upon the Earth.

Poetry, join, then, with austere Science in a song—a duet of love and recognition to Nature, who is able, with extremely simple means, to accomplish the most marvelous phenomena. Intone a hymn to the sun, as in the times of those distant peoples who adored the deified Astræa.

MODERN QUEEN-REARING.

As Practiced at the Root Co.'s Yards; a Brief and Comprehensive Treatise on the Latest and Best Methods, Gleaned from all Sources.
Continued from Last Issue.

BY GEO. W. PHILLIPS.

One frame of sealed brood (preferably hatching) and one of honey with enough adhering bees to cover both will be enough for a nucleus, if the weather is warm; but if not, the strength must be increased. As a rule, it will be necessary to shut up these little colonies for three days in order to let them remain in their new location, although where one knows how to manage, he can choose brood and bees of such an age that the confinement will be unnecessary. By giving twice the number of bees and all hatching brood, one can obtain a nucleus of desired strength even after the older bees have deserted. These nuclei can be formed in regular-sized hives, and a division-board adjusted to the size of the cluster.

Upper-story nuclei.—Divide a hive-body into three compartments, the same as recommended for cell-building; only, instead of using perforated zinc division-boards, use wirecloth on a framework of wood. Tack a screen of the same material on the bottom of the hive-body. Bore three one-inch holes near the bottom edge to act as entrances, one in each side and one in one end. Put it on as upper story to some strong colony, letting the hole in the end turn in the direction opposite to the entrance of the colony. Form three nuclei in it as advised above. This kind of arrangement

helps to conserve the heat, makes their manipulation handy for the bee-keeper, and renders uniting easy. Let each compartment have a separate cover of thin board, and over the whole put a regular hive-cover. Don't form your nuclei until the cells are

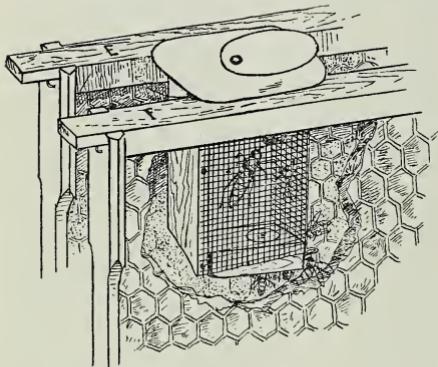


Fig. 10.

ripe. If you do, there will be no advantage gained, as they will have to remain queenless until that time any way. Put the cells in protectors, and give one to each nucleus as it is formed, in the manner indicated in Fig. 10. By the time the virgin hatches, the old bees will have returned to their old location, and the young bees left behind will accept her readily.

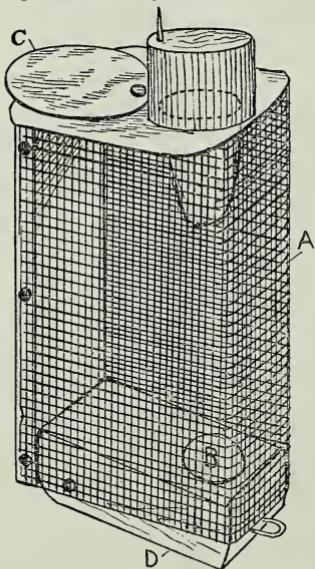


Fig. 11.

It will be seen by referring to Fig. 10 that the wooden cell-block does away entirely with the use of the tin cover on the West protector.

THE QUEEN-NURSERY.

The nursery is essential to successful

queen-rearing. Especially will it be found indispensable by the man who produces queens on a large scale. Fig. 11 shows a combined nursery and introducing cage. This was gotten up by Mr. Abram Titoff, one of our apiary hands. The top is made

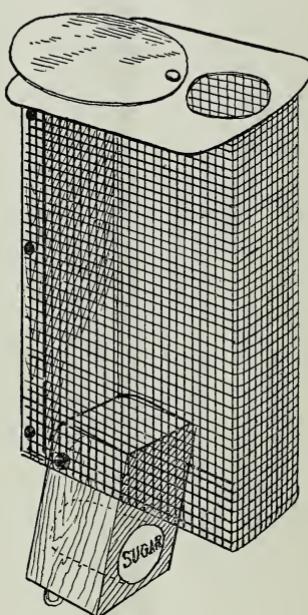


Fig. 11.

of tin, and has a hole in it for the reception of queens or queen-cells. A piece of the same material loosely riveted serves as a cover for this. The body is made of wire cloth, and at the bottom is a hinged block of wood with a hole for candy. The candy-hole has a bit of tin pivoted in the center on the outside of the block, and so arranged as to cut off or expose the candy; see Fig. 1. This arrangement will be referred to further on.

Ten days after the cells are grafted, remove them from the queen-rearing hive. *Don't shake off the bees* or you will in all probability ruin every queen. Give a little smoke, and brush them off with a feather or small brush. Set the frame on the ground in a standing position and in such a man-

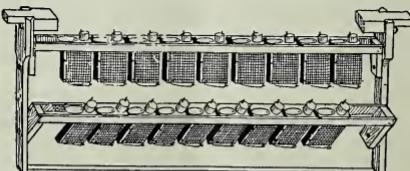


Fig. 13.

ner that it won't fall or slip in any way. Detach the blocks one by one; with your finger daub a little honey on the end of each cell so that the queen can feed herself

while gnawing her way out, and place it in the nursery-cage as shown in Fig. 11. Bear in mind always that you can not be too careful in handling sealed queen-cells. The slightest jar will sometimes kill a queen or injure her seriously.

Fig. 13 illustrates a nursery-frame full of cages with ripe queen-cells. Put the frame in a strong upper story, or, where this is not obtainable, in any queen-rearing colony, or even one with a normal laying queen. Always see that the cages have a supply of fresh candy so that, should the bees refuse to feed the virgins when they hatch, they will be in a position to supply themselves with food; also see that the tin covers the candy-hole in each cage; if not, the bees will eat their way in and your cages of cells will soon be in a bad mess. Where virgins have to remain a week or more in confinement, they will be found to do better in a queenless colony, as queenless bees will lavish more attention upon them.

To be continued.



NAIL SUPPORT FOR FRAME.

Mr. Root:—On page 1044 you want to hear from those who have tried a nail for a frame support, and not sooner or later abandoned it. I first used it in several hundred hives that I built in California as far back as 1876. I then used a cut nail. I now use a headless wire nail, made to my order at the factory, and decidedly prefer it to any other support for a *self-spacing* hanging frame. But when I used it without any self spacing device, and allowed the frame to swing loose, as on a pivot, I soon decided against it as being entirely *too* movable for practical purposes. Your objection, that a nail is not strong enough, is overcome by using a larger one. A six-penny finishing is much too small.

If we were using the Hoffman frame I should prefer it supported by a headless nail, and then omit the tin rabbet as needless. You have practically the same thing in the Danzenbaker hive.

I. A. KING.

Derby, Texas.

[The device used on the Danzenbaker is not a nail but a large iron rivet, the shank of which is very much larger than an ordinary nail. Then, further, the rivet head is *imbedded* in the wood on the *inside* of the end-bar, making the part that projects much stiffer.

Extracted-honey men, at least many of them, would object to a nail support for the ordinary hanging frame. As it is, some of

them don't like the shortened projection of the end-bar as now used on the Hoffman frame, and I fancy the nail would be more objectionable still.—ED.]

FORMALDEHYDE FOR FOUL BROOD; THE REASON IT SOMETIMES FAILS.

I have noticed some discussions about the use of formaldehyde for the destruction of foul-brood germs. Some seem to think that it is of no use; but I know the failures occur only through a lack of knowledge of the gas and of its use. Some data I have gathered from government reports and other sources. I have learned that the foul-brood germ is a fungus composed of albuminoid matter. Formaldehyde gas unites with it, and decomposes it so that it will not grow. Brother Weber's treatment is all right, but the dried-up cells that he speaks about should be immersed in a three per cent solution of formalin for a few hours, in a temperature of about 80°, then subjected to a fumigation of the gas in a temperature of 40°, and it will not fail in any case. The English use it in a solid form in the rear part of the hive on the bottom-board. Colonies that are afflicted with the disease are rendered immune as long as the gas is allowed to remain in the hive, but will reappear when taken away. Formalin gas is now used as a disinfectant for all contagious diseases by the boards of health of various cities and towns of our country. Why not give it a thorough trial? I do not see why GLEANINGS should not have a laboratory, and investigate. I for my part would be willing to pay an increased rate of subscription to cover the expense. The paper would give facts, not summaries. What say you, brother bee-keepers? I think it would pay.

Massillon, Ohio.

E. A. NEWELL.

[A laboratory would hardly be practicable at this office, as there would not be enough work to keep it going, even if we could employ a competent man to take charge. It would be better for us to depend on the statements of trained men at our universities and colleges, where all the facilities are at hand.—ED.]

HOW TO PRODUCE GILT-EDGED BUCKWHEAT HONEY.

The production of buckwheat comb honey during a good season is quite simple, and consists in boxing all strong colonies. Sometimes the conditions are such as to produce a swarming mania. Especially are such colonies disposed to swarm as have old queens. They are usually the colonies we "shook," or the new swarms, and are not on a full set of combs. When the season is not very good, and we care not for any increase, a very good way is to unite two and two of such colonies and shake them. Later these shaken swarms may be reinforced with bees from upper stories, the same as was done during the white-honey season. But one must feel his

way. This reinforcing at this season of the year does not always work. Sometimes the added bees are unmercifully slaughtered. If the bees are disposed that way, better not try the experiment a second time. In order to obtain the finest honey I shake on but five frames or a half-story, the latter giving the best result. Only starters are used. The brood-combs obtained are massed together on as few hives as practicable; and when the season is over, the swarms that were shaken on half-stories are placed back on to these same combs; those shaken on full-sized frames receive enough of the combs of honey and brood to fill up their hives. When this is done as soon as the honey-flow ceases, in this locality about Sept. 7, the colonies so treated will usually be in good shape for winter. If wintered in the cellar they come out just as well in the spring as others that were on a full set of combs all the time.

When the buckwheat season begins I often find myself with colonies that were tiered up with those sets of brood-combs from the latest shaken swarms. Sometimes there are three or four sets of these combs on one stand piled up, with an immense quantity of bees in them. The colonies with queens of the same year's rearing are simply reduced to one story about Aug. 6, and the sections are applied (only small starters in them). A large yield of fine buckwheat comb honey may be expected of them. The colonies having old queens are shaken on half stories; starters only both in frames and sections. At this time of the year there is little danger here of pollen being stored in the sections. These colonies will produce the honey that will tickle the palate of the epicure (if it is buckwheat), and take the cake at the fair if the judges know their business, and not give the all-worker comb honey built on comb foundation the preference.

F. GREINER.

Naples, N. Y., Dec. 22.

THAT CELLAR WITHIN A CELLAR; THE ADVANTAGE IN HAVING A FURNACE IN A CELLAR.

My cellar within a cellar is working finely—see page 1009. I can absolutely control temperature, secure the requisite dryness of atmosphere, and have the air as fresh as it is out of doors any time. Of course, it requires constant attention; so does my furnace; and as I attend to the furnace I look after the temperature of the bees. A thermometer hanging inside gives the temperature; and if I find it too high I open the window sufficiently to adjust the difficulty. If too low I have the door of the bee-cellar open to let in a little of the cellar air. In this way I can keep the temperature within 5 degrees all of the time. I do not think I have spent ten minutes a day regulating the affair, and I do it in connection with caring for my furnace. There is no doubt in my mind that in this climate, $44\frac{1}{3}^{\circ}$ north, a furnace cellar can in this way be

better regulated than any other cellar. If I had a large number of colonies I would box the furnace in the same inexpensive way I partitioned off a corner for the bees, thus utilizing my whole space for the bees, operating the same regulating process which I now use. I can not speak at present of the ultimate outcome, but I do know that I am controlling the temperature, and securing conditions which are in harmony with good results. I offer this bit of experience for what it is worth to some one who may be as perplexed as I was.

Gardiner, Me.

L. H. CLARKE.

DASYLLIS SACRATOR, OR BEE-HAWK, AND HOW TO KILL THEM.

I notice on page 725 that Mr. Frank Benton doesn't seem to think it practicable to destroy the bee-hawk. I think that, if he were here trying to raise queens, he would wish that they were all dead. I suppose that, where there are only a few, they are not so much to be dreaded; but there are thousands of them here. One of my neighbors told me that he has had quite a little trouble with them. When his young queens go out on their wedding-trip they don't get back. In this locality they are very destructive to bees. I am satisfied that they catch other insects; but they are not apt to bother about hunting them up when they can stay right in our bee-yards and see thousands of bees at one time.

I was a little surprised one day last summer to see a bee-hawk holding to a good-sized bumble-bee. I hardly ever see many of them before July, and raise my queens in May and June, and they are not here then to catch them. We have a few mosquito-hawks here. I have seen them in the bee-yard. They have four wings, and are larger than the bee-hawk. My advice to friend Stafford is to use a shotgun on them. Get the smallest shot you can find, and put small loads in the gun, and kill them; and my advice to all bee-keepers is to kill every bee-hawk they can. There seems to be more of them each year. W. T. DAVIDSON.

Velken, Ind.

A 12-LB. SWARM; DOES IT BREAK THE RECORD?

On page 1041 you express the opinion that a 9-lb. swarm is the biggest we shall ever have in the northern part of the United States. You will have to change that opinion. On July 3 of this year I had a swarm come out of a hive that was on scales. I had balanced it about ten minutes before; and when the bees were all out, the scales showed a loss of 12 lbs. The hive had two stories (eight frames), with the queen having access to both. GUSTAVE GROSS.

Lake Mills, Wis., Dec. 19.

[We shall be glad to get reports from others. Perhaps we can break the record again. Let's see—a 12-lb swarm means from 50,000 to 60,000 bees. Who will beat this?—ED.]



RECENT DEVELOPMENTS IN THE FIELD OF SCIENCE.

What hath God wrought?—NUM. 23:28.

In my earliest childhood, as far back as I can remember, it was my delight each day to find out some new wonderful thing to be investigated, explored, and perhaps discovered. My first financial venture was in poultry. By the way, I am told I asked so many questions when I was a child, that no one could answer, there began to be a demand about that time for cyclopedias. My grandfather had an old one which I used to borrow, and study with great delight. When I first became the owner of some chickens I began questioning everybody. Then I got hold of some agricultural papers, and went over the numbers for a year or more back, just to find out all there was said about poultry; and being still unsatisfied I began to question my "biddies" themselves; and I began at a very early day to learn "hen language." You may laugh at this, but my fowls themselves began very soon to tell me in plain language what they did want, and also what they did *not* want—sitting hens, for instance. Whenever one of my biddies wanted to sit, she said as plainly as words—yes, plainer still—"You just let me alone. I know my own business." Her words were emphasized also by sundry pecks. Hitherto I had been in the habit of giving her loving pats on the back; but now she just wanted to be let alone. In due time some chickens were hatched; and no one who does not love poultry as I loved it then can imagine the delight with which I studied and investigated these interesting bits of God's handiwork. In searching the agricultural papers and cyclopedias for facts about poultry I ran on to no end of wonderful things; and the knowledge thus gained has been of inestimable value to me all through my busy life.

And herein is the value of selecting some line of work—to get astride of, as a hobby you may say. If one goes at it with energy and determination, studying it at every opportunity, every line, even remotely connected with his new "craze," it gives him a vast amount of information that will now and then through life be of value to him in getting a symmetrical and well-rounded knowledge of men and things.

When I was twelve or thirteen years of age I got a glimpse of the wonders of electricity. The new science was just then unfolding, gradually. I wanted a galvanic battery. My friends all around said I was not old enough to make one. I remember investing some of my hard-earned pennies at the tinshop, in copper and zinc. The tinner told me I was not old enough, but I

pushed ahead. My battery worked all right, but I had it for months, and did not know it. If I remember correctly, I cried over it. The trouble was, I had not the apparatus to go with it to make its power manifest. Well do I remember the day when I balanced a magnetized steel pen on the head of a pin driven into the table, in my little bedroom. The steel pen promptly swung north and south, like any magnetic needle. This I was familiar with. On this particular day, however, I placed the wire, which connected the copper and zinc in my battery, just over the top of the balanced steel pen. When I made the connection, the steel pen jumped with a new life, and swung around toward east and west instead of north and south. My battery was O. K., and for the first time in my life I was the owner of an electric current that exhibited energy. As soon as I could make the necessary arrangements the steel pen was off at a distant part of the room, and some cheap iron wire carried the current. With my battery several yards distant I could make the steel pen swing to the right or to the left; and then I got a glimpse of the fact that the same thing could be done, even with a battery a mile or miles away. From that time on, my experiments succeeded. Before I was eighteen I was traveling around to the schoolhouses, giving exhibitions or entertainments, and teaching, after a boyish fashion, to eager crowds, the future possibilities of electricity and chemistry. Electricity was my craze until I got my eyes and my mind on the honey-bee. I need not tell you of this, because most of you know more or less about it. Of course, all along there have been more or less side issues of exploring, of inventing, and discovering; but the point I wish to make here is that no one knows of the joys and thrills of pleasure that come to one who delights in exploring God's works in this way unless he has been through it himself. A good many times people say to me, "Mr. Root, you need a little more charity and sympathy for people who are not like you. You never care for games of any sort—baseball, croquet, lawn tennis, etc. You may not need recreation as other people do; but the majority of the world need *rest*—a change of work and a change of thought."

We have all heard something in the line of the above, again and again. I do not think I am so very much different from the rest of the world, after all. I like a change of work and a change of thought; in fact, I am changing my occupation and my thinking every day of my life. But some way or other, I do not just feel satisfied unless *each hour* produces some profitable result. I can not with a clear conscience ride a wheel or take a trip in my automobile unless I have some *special errand*. I want to accomplish something. I should be ashamed to have people think I was riding about just because I wanted to pass away the time. God forbid that I should ever wish to get rid of a single hour that he in his wonderful kind-

ness has seen fit to grant me as a precious gift.

Now, do not misunderstand me. This following out and developing new lines is not an unalloyed joy. I never could have experienced that thrill when I was experimenting with my simple apparatus with a battery and steel pen had I not been through weeks of discouragement because my battery would not work; neither should I enjoy my automobile as I now do had it not been for the days and weeks that it took me to learn all about a machine that is necessarily more or less complicated. Men who have wealth, especially where the wealth has been inherited, so they do not have to work hard for any thing, can have no such enjoyment as you and I have. They are to be pitied. At one time when I was studying the honey-bee the matter seemed to be so intricate and complicated I could hardly believe I should ever get to be an expert. I once bought a choice queen. I searched for the black one I wished to replace, until I was almost ready to give up in despair. I told my good wife that, if it were not wicked to waste so much money, I would make a trip to Quinby or Langstroth, and ask them to teach me how to find the queen in a hive full of black bees; and I remember distinctly wondering then whether it were possible I should ever be an expert in that line, and be able to teach others. Why, I craved the possession of skill, along that line, more than I craved any thing else this world has to offer. Little by little I acquired the coveted knowledge; but it took months and years to do so. Later I became interested in greenhouses, especially growing lettuce under glass. I had bad luck with it. I wrote to Peter Henderson, and asked him so many questions that he probably could not take time to answer them. Then I sent him some postal cards addressed to myself, and begged him to write yes or no in answer to my questions. He kindly did this, and added some valuable information—at least it was valuable to me; but the matter was very complicated, and there were so many circumstances and conditions, many times, that I despaired of ever becoming an expert. But I followed this line of work for over twenty years, and succeeded beyond my highest expectations. I not only learned how to accomplish wonderful results, but I keenly enjoyed the pleasure of writing books on strawberries, potatoes, tomatoes, and other garden products, telling others, who were eager to know, how these results could be accomplished.

A few days ago, when I was having so much enjoyment and so many triumphs over difficulties in running my automobile during the winter time, I felt as if I must give other people the benefit of my triumphs; but I reasoned that our journal is a bee-paper. Of course, it has a side issue in High-pressure Gardening, Health Notes, etc. This is all right, for a great part of our bee-keepers are also more or less engaged in growing crops; but when it comes to

the auto I reasoned there are probably so few who feel as if they could afford one, or even were interested in the matter, that such talks would be out of place. Perhaps the greater part of our readers are prejudiced against automobiles. I considered writing for some one of the half a dozen or more automobile journals; and then there came a feeling that I have not for years written any thing for any journal except GLEANINGS, although I have had some big offers of pay if I would do so. And then I made this decision—that, so long as God lets me live, whatever good I can do in the way of teaching or instructing shall be given through the journal that I started almost in my boyhood. Since making that decision I have found quite a few bee-keepers who are thanking God that it is their privilege to own and enjoy an automobile. There is Doolittle, of New York, and Mercer and McIntyre, of California; and another, whom Ernest has recently visited and ridden with (Mr. F. A. Salisbury, of Syracuse, N. Y.), in an Olds automobile purchased since I bought my own. People talk about "riding hobbies;" but the auto and the wheel are the only hobbies I have ever been able to ride in real truth.

Now I wish to tell you something about the enjoyments I have had with it during the past wintry months of November and December. When the zero weather came on us so suddenly I was reminded that the water in the radiating-tubes would freeze and burst the pipes unless something was done. So I took the poultry-house I have told you so much about, close by our dwelling—the one that is over the pipe that carries the exhaust steam to our home. The hot earth underneath keeps it all winter long above the freezing-point. By making double doors instead of a single door, the automobile goes back into this poultry-house. It is a nice warm place when any repairs are needed. There is an abundance of daylight, for the south side and the roof overhead are made of glass sashes. As an electric wire runs near, I soon had this house lighted by electricity, so I could look the auto over evenings, giving it loving touches here and there, just as I used to do with poultry when I succeeded in making them lay in winter. Well, the auto would start out; and after the engine was once in motion it would keep the water warm, even in zero weather. But sometimes I wish to stop for an hour or more, leaving the machine outdoors. This is especially the case in attending church. By the way, I have never heard, that I know of, of any one before using an auto to take people to church. It makes me sad to think that the greater part of their owners, so far as we can learn from the automobile journals, not only do not attend church, but I am afraid they never think of churches. The great runs are mostly made on Sunday; and I fear this is often the case, because Sunday is the only day the owner can get away from business. A man and his wife recently made

a wonderful trip in an automobile of his own manufacture; and he made it on Sunday, taking his wife along. Let me distract.

Mrs. Root has for several years lamented that we are so far from town and from church; and she has even asked the question if we could not, as we got older, have a residence near the church, markets, stores, etc., and live there, at least in winter. Just now we are more than half a mile from church and Sunday-school. Well, the auto has solved the problem. For the last two months the children (and grandchildren) have all understood that, if they wanted to make father (or grandfather) happy, they just had to tell him they would like to be taken up street at such an hour or minute. This gives me the open air in all kinds of weather, and I never tire of running my beloved vehicle.

One morning recently I carried four loads of people from "Rootville" up to the church. We usually take four at a load; but we can easily carry five when the roads are good, and six or seven if part of them are children. Of course, I would not think of running my auto on Sundays just for the fun of it, frightening horses, perhaps, when there is no particular need of it. The way I manage, however, I seldom frighten a horse; but sometimes it is a little annoying to the drivers. I have learned so that I can slow up to a speed not faster than a person can walk, and with the machinery so managed as to make almost no noise. Then by talking to the horses I get by without any trouble.

Something comes in just here that reminds me of the dear friends who have criticised because they feared I was getting to be a little loose on the question of Sunday observance. By offering to take them on the auto I got several people to go to church who might not have gone otherwise; but if you should question me closely, and ask me which was the inspiring motive, to get people to go to church or to have an excuse for running my beloved auto on Sunday, I am afraid I might have to plead guilty to the latter. I for one would be exceedingly glad to see all the automobiles used to enlarge instead of decrease church attendance. Between church and Sunday-school a lot of our people want to be brought home; and after Sunday-school there are usually two trips more; and in order to get all our people out to hear the excellent sermons we have Sunday evening, I have the same program over again. After dark I enjoy the fun of lighting the lamps and seeing every thing work to its fullest perfection. Why, in the drill I have had in working with and manipulating that auto I can detect the slightest sound or vibration of the machine when it gets a little bit out of order. When others can hear nothing at all I am following out and locating the slight imperfection. Since I have been on this drill, and acquired a trained mechanical ear, it annoys me to hear a door opened when the hinges need

oiling; yes, and when somebody grasps a doorknob where the interior of the lock is grinding for want of oil, I feel an almost irresistible impulse to get my neat little screw-driver and equally neat oilcan, pull the lock to pieces, and give the parts timely attention that are going to ruin because of the need of oil.

Well, I shall have to confess that, in going to and from church, my mind and all my sensibilities are keenly on the alert in watching and enjoying this new hobby; but when I get inside, I doubt if our good pastor has many hearers who listen more devoutly and intently than I do. I have heard him say that no other one of his hearers questions, asks for further information, and sometimes criticises, as much as I do. Exercising all my faculties in using that automobile Sunday morning wakes me up and prepares me to take in the sermon much better than I could otherwise.

A word here about leaving the auto standing out in the cold during the sermon. After much investigation in reading the auto journals I have discovered that, if we add to the four gallons of water in the tank, ten per cent of glycerine and 3 lbs. of calcium chloride, the liquid or solution will not freeze. In fact, I keep a saucerful standing outside of the auto-house all the time to be sure that the liquid in the coils can not get frozen up.

Now to the question, "Is it a piece of extravagance on my part to pay \$650 for such a machine, or is it a good and sensible investment?" While I like horses in a certain way, I do not enjoy caring for them. I do not like the smell of the stables, I do not like to be obliged to clean a horse every morning, and I do not like to hitch one up in winter. I dislike plodding around in the snow, handling an icy harness. Perhaps I might have a warm stable—one that is always warm, like my auto-house; but I should not enjoy it even then. It takes time to hitch up a horse; but the auto is ready to start off in an instant. It is never tired; it gets there quicker than any horse can possibly do. A skillful operator will back up, twist around, run in and out of intricate places, in much less time than any horse could be manipulated. I can take the women-folks up town, bring them back, do errands, and manage it all with my overcoat, and with thick warm mittens on my fingers. The heat of the engine keeps the vehicle warm to a great extent, and a comfortable robe does the rest. Yesterday a pretty fair-sized wagonload of bee-journals was to go half a mile to the postoffice. The horses were not hitched up, and the driver was helping in the lumberyard. I said I could take all of the mail sacks nicely at two loads; but we finally piled them all on at one load. It was a little trouble to keep them from falling off; but I got them to the postoffice much quicker than could have been done with horses.

When the machine is in perfect order, the time required for it is very little indeed.

Much less oil is needed in winter; and so far as giving it water is concerned as we have to do in summer, a quart of water once a month seems so far to be ample. I very well know that the repairs have, with many machines, taken a big lot of both time and money; but we should all remember that these new vehicles are in a great measure still in embryo. New inventions in the way of short cuts are coming thick and fast; but the time is already here when many kinds of business—that is, many kinds of transportation of both passengers and merchandise—can be managed with the automobile quicker and perhaps *cheaper* than by the aid of a horse.

Now, this paper is already a pretty long one; but I wish to mention one thing more that just now thrills my very soul.

"THE TRUTH ABOUT RADIUM."

The above heading is the title of an article in *McClure's Magazine* for November. If you have not seen it, and especially if you are interested in the wonderful developments in the scientific world, I would advise you to get it and read it. When the stories first came out in the papers about radium I pronounced it a humbug, especially the part that claimed it gave off both heat and light as well as energy (radio-activity) without being consumed, or losing any of its weight. Soon after reading the article in *McClure's* I imported from London a microscopic sample of radium. It has been in my possession for just three days. The instrument cost \$9.00. It is about the size of a small seed-microscope, and it contains a quantity of chloride of radium; but the quantity is so small that you could scarcely see it if it were suspended on the point of a needle. But this little bit of radium has been for three days past (I do not know how much longer) sending out showers of tiny shooting stars. It has been described somewhere as "the bombardment of meteors." You look down in the lens of the microscope, and see something I can describe only by saying it looks like a piece of iron which a blacksmith has overheated, throwing out sparks in every direction. We are told this keeps up *forever and ever* without any loss to the radium—at least none that can be measured by the finest scientific tests. I put it on my stand by my bed every night; and whenever I awake to consciousness I get up to see if it is *still* there and still glowing. In the night time, when it is pitch dark, the flashes can be seen flashing out of the eye-piece, at a distance of several yards. In this position it looks like a twinkling star. There is a regular "twinkle, twinkle;" and when you put your eye down to the eyeglass there is that wonderful "bombardment," a perfect shower of brilliant scintillations or shooting stars all radiating from a common center; and the crowning wonder of it all is that it *never* ceases.

I can not take the space here to tell you all about radium. At the present time I am

told that a large refining factory in Germany is working day and night to fill orders at \$2000 a gram. The dictionary says a gram is equal to the thirtieth of an ounce. When the article to which I have referred was written, there was only about an ounce of radium in the whole world; but nobody knows how much there is now or will be during the year to come. May God be praised for these great and wonderful gifts he has bestowed, and is bestowing, on those who are willing to *study and toil*, and to search out and find the gifts he has provided for us, even before the world was.

IS THE "SCALPING" BUSINESS IN SELLING RAILWAY TICKETS A SWINDLE?

Mr. A. J. Root:—You speak of ticket-scalping as being a swindle. Now, I fail to see wherein it is a swindle. Of course, it is wrong for a man to sign a wrong name; but the blame for his doing so rests with the railroad company that forces him to do so in order to get his rights. When any one goes up to a ticket office and buys a ticket to some distant place he doesn't buy a bit of cardboard nor a strip of paper. He buys *transportation for one person*. Whether for himself or for some one else makes no difference to the company, so long as it is paid for said transportation of one person. The reason there is so much red tape about the tickets is because there is money in it. Some one either loses his ticket or doesn't want to use it, or possibly for some reason can't use it. The railroad company has been paid for it, but won't give the transportation to anybody else, simply because it has the power not to. Uncle Sam pays the face value of the transportation charges on stamped envelopes etc., back to any one when the envelopes are damaged beyond use, simply charging for the envelopes which are spoiled—a case analogous to the above.

I read your articles in *GLEANINGS* with a great deal of interest, and should like to hear from you on this subject again. There are too many wrongs in this world yet for any of our good prominent writers to be upholding any of them.

R. H. YEARNSHAW.
Walnut Grove, Cal.

Friend Y., I am glad to answer you, because I think a good many other people are making just such mistakes as you have made. You say when one goes to the ticket-office he "does not buy a bit of cardboard or strip of paper," etc. Now, this whole matter depends on what the agreement is. In order that there may not be mistakes or room for argument, the railway company prints what it agrees to do on every ticket sold, and it seems to me they make it very plain. A few days ago I went to a ticket-office in a neighboring town and called for a ticket to Medina, Ohio. I took the ticket and laid down the money. When I handed it to the conductor on the train he looked at the ticket and then at me. Said he, "Where do you want to go?" When I replied, "To Medina," he held the ticket up before my eyes, and it read to a town off in another direction. I argued that I was an innocent party in the transaction. I called for a ticket to Medina, O., and paid the money for it. I said, "If a ticket agent in the employ of your company did not give me what I asked for and paid for, your company is responsible and not myself."

He replied, "You and every other purchaser of a ticket are at fault if you do not look at it and see whether it reads as it should. Because you did not look at the

ticket at all I shall have to ask you to pay your passage. When you get to Medina, if you will hand it to your ticket agent he will send it back to the seller, and return you your money."

Some of you may not agree to this; but I think, on further reflection, the conductor was right. Whoever buys a railroad ticket, or any thing else, for that matter, should examine the article and see whether it is exactly what he paid his money for and expected to get. The man who pays his money, and then sticks his purchase in his pocket, without looking at it at all, ought to get into trouble to teach him to watch and see what he is doing—not only to avoid being swindled, but to save trouble and unnecessary delays in the general business of life. Let us now go back to our statement.

There are a good many kinds of railway tickets. Some of them say, "For this special person and this special train." Other kinds of tickets read just as you have it—transportation for somebody, no matter who, to a certain place, no matter when, or within a limited period. Tickets of the latter class, scalpers can use legitimately; but tickets of the former class can not be used, as I see it, without transgressing legal or moral law.

Then you make another mistake in saying the railways make a speculation on the one who loses a ticket or who does not use it or *can not* use it. I suppose you know I travel a great deal. Very often I can not use the ticket I have purchased; and in every case of this kind so far in my life the railroad companies have paid me back the price of the ticket I could not or did not use.

At Niagara Falls I blunderingly got on the wrong train, and was obliged to pay \$2 50 extra to go to Toronto on the boat. When I told the railway company about it they paid me back the price of the ticket, and returned to me the \$2.50 I had paid the steamboat company because of my blunder. I did not lose a copper by the transaction, because a railway man told me when I got aboard I had the right train, when he was mistaken. At the Buffalo exposition I purchased a sleeper ticket from Buffalo to Cleveland. After I got on the train I found the sleeper would reach Cleveland before midnight. I explained my blunder to the conductor, and he said if I chose to take a seat in the other car the sleeper company would *probably* return the money when I explained the matter to them. They did so without a word.

Now in regard to excursion tickets. This is a complicated matter, and perhaps my explanation may not be correct. If so, I wish some railroad man would set me right; but it is something this way:

The railroad companies make preparation to carry a great number of passengers to some particular point, on account of the G. A. R., or something of that kind. They run extra cars—perhaps extra trains. They try to make a wholesale business of it. They say,

"If you will go on such a date, and use a ticket that applies only on the special train, we will carry you at half the regular fare, or less." Well, in *going* this works all right. They can carry a big crowd a great deal cheaper than they can a few persons. But many of these persons are Yankees. They want to look over the world, and they do not want to go back until they get ready. Furthermore, they usually want to go back some other way, so their return trip will be through some part of the country they have never seen before. Well, these railway companies, when they take a notion, are very liberal, and so they say, "If you go with us on that special train we will not only let you come home when you wish, within a certain limit, but we will let you choose your route home. If you prefer to travel on some other road than ours on the return trip we will take the money out of our pockets and pay this other railroad company cash for carrying you."

Now, this the railroad company could afford to do if its patrons all did exactly as they agreed, or according to the printed agreement on the ticket; but the railroad companies have learned by experience that these same Yankees who are so anxious to see the whole world, and stay as long as they please, are also greedy on a trade, especially if they can make a trade so as to save a little money. Some of them may conclude to stay a while, we will say in California; and when one of them runs across a man who is going back east he sells him his ticket at a very much lower price than he could buy one outright. But this new party has to pretend he is the original purchaser. He has to sign a name to the ticket that is not his own. He does something that would be called forgery, if it were not in a railroad-ticket deal. You admit this is wrong; but you seem to take the ground after all that the railroad company is not injured thereby. But it is injured. It loses customers who would otherwise pay the regular established prices. Many seem to think these prices are a great deal too high, and that it is not any thing particularly wrong to cut down the price established by the railroad company. But, my good friend, these same companies have agreed on an established price. You can not travel on any other railroad, and you can not travel in any other way any cheaper than the regular printed rates. If their prices are too high, as with every thing else there will soon be competition, and prices will come down. I do not know that ticket scalpers are always dishonest men; but they are usually a *tricky* sort of people, and every one who deals with them knows their reputation. They do not make a living by dealing honestly as people do in other lines of business. Very likely a part of their business, and perhaps a great part of it, is legitimate and honest. I for one want nothing to do with a man who coolly looks you in the face and says there is nothing wrong in signing another man's name, for the reason that

"it is done every day by all sorts of people." Just one thing more in closing:

People in all kinds of business offer special bargains, or special low rates, providing you comply with certain conditions. A good many times an outsider can not see what difference it makes whether you comply exactly with the letter or not; and perhaps it might take considerable time to make the thing plain to customers who want something a little different. I might give one illustration right here. A man wants a hundred hives; but he does not want them exactly like the regular run. He explains to me that the change he wishes will be really less work than the regular goods; but when I tell him they will cost him more money made that way, even though I admit it requires less work on the hives, he can not or will not believe I am honest, even when I explain it will cost us quite a little more than to have him take the regular goods. The trouble is, he fails to recognize that we have to stop a busy factory, or throw things out of joint, more or less, to make something out of the regular routine. Now, it is the same way with our railroad companies. Whenever I have a chance to look into their methods of management I find reasons for their "red tape," as we call it, that I could not understand when I stood outside.

SOME REFLECTIONS (?) IN REGARD TO THE CLERKS WHO HAVE CHARGE OF OUR SUBSCRIPTION DEPARTMENT.

Every little while some of my good friends of former years get a notion in their heads, perhaps quite naturally, that, since their old friend A. I. Root has dropped out somewhat from the active part of our business, things are not attended to as they used to be in the "good old times." Below is a sample of what we get once in a while—not much of a sample, after all, because I do not know that we ever before received any thing quite so "strenuous." I have no scruples about printing it, from the fact that he has particularly requested it, as you will notice.

The A. I. Root Co.:—What is the matter with you? For ten successive weeks I have asked you to change my address as above. GLEANINGS does not come. I got a few stray back numbers that I succeeded in whipping out of you. My former postoffice was Mid-dagh's, Pa. Send me Dec. 15 GLEANINGS at once. I will stoop no longer to your injustice through carelessness. I have wasted postage enough on you. You can return my subscription money, and then I will expose you in the other bee papers as a warning to others. Dear old GLEANING'S! Must it come to this? For twenty-seven years I read its pages; and has it now become the child of inefficiency so far as I am concerned? Don't go to wriggling, and say you have many satisfied friends. Wasn't I a satisfied friend a long as you treated me right? Make a new resolution on New Year's day, or must it be good by?

Print this, so A. I. can see it.

Bangor, Pa., Dec. 26.

JOHN H. JOHNSON.

Of course, the above came right into my hands the minute it was taken out of the mail; and I called a halt among the clerks, and, I was going to say, demanded—but I think that is not quite the word—I quietly asked for an immediate investigation.

Before I tell you what I found, want to say that common prudence or good sense should have indicated to our irate friend that there was some fault somewhere besides with the A. I. Root Co. Just now I glance over the card, and notice that both the first and last names are exceedingly common. I suspect that somebody else of the same name or a similar one has been getting his mail and carelessly kept it. We have had many such troubles in years past. This might account for somebody else getting his GLEANINGS; but how about his letters and postal cards for "ten successive weeks"? I confess this is rather a stunner, and I am almost forced to conclude our friend was so stirred up that he used a little exaggeration. In hunting up all the correspondence from him we find he requested us to change his address as above, Oct. 17, and we did it promptly. No reply was made, because we usually do not answer such letters. But the printed number on every number of GLEANINGS since then shows that the change was promptly and correctly made. Just one other postal card has come to our office. It reads as follows:

The A. I. Root Co.:—This is the third time I write you that you owe me the October 15th GLEANINGS of 1903. Please send me a copy and oblige,

Bangor, Pa., Nov. 24.

JOHN H. JOHNSON.

It was received Nov. 27, and the number asked for was promptly mailed.* I do not think he succeeded in "whipping" us out of any other back numbers, because no other request had reached us for any of them. Now, friend Johnson, are you not a little rough when you say, "I will stoop no longer," etc.? In regard to exposing us in the other bee-journals, I have not a bit of objection.† If there is any thing about our company that needs exposing, let it come out; and even if it is a mistake, I for one

* I can not find that the young lady who has charge of our subscription-list was in any way at fault, except that she should have written you, in reply to your postal saying that you had not received the number asked for, and tell you the missing number was promptly mailed. I shall have to admit, perhaps, that the average clerk is not usually quite as ready to investigate such a complaint, and to write to the party, as perhaps A. I. R. himself would be likely to do.

† Since the above was written we have something further from friend Johnson. We find our subscription clerk did abbreviate in writing the name of his county. Instead of writing it Northampton she wrote it "North," which stands just as much for Northumberland as Northampton, and both of those counties are in Pennsylvania. This may have delayed his journal. I did not know that our clerks were doing this, and I just gave orders all over the office not to abbreviate counties to such an extent as to lead to possible confusion, as in this case.

Friend J. says further he suspects that one of our clerks got his complaining cards, and, finding his address had already been changed, "threw the cards into the fire." Let me say to one and all, there are no "fires" in our whole establishment except under the boilers. Our rooms are all heated by steam. Furthermore, postal cards or letters from anybody on any subject are never put into the waste-basket. Every written communication from any live man, woman, or child, is saved for future reference. Of course, we do not save printed letters, or letters that are "make-believe" that they are written by somebody. All these communications are kept on file so we can get hold of them instantly whenever some occurrence like the above demands every scrap of correspondence that can be produced.

do not feel troubled about it. The good book says, "Blessed are ye when men shall revile you," etc.—that is, if it is *not so*. If you have been for 27 years a reader of GLEANINGS you are entitled to it for one year free. We are not going to "wriggle" a bit, friend J. It is not like us; it is not our way; but we are going to investigate this whole matter most thoroughly. I want you to carry this to your postmaster; and if he is a good man, as I suppose he is, he will help you to unravel every bit of it; and we are not going to say "good by," by any means. Why, bless your heart, old friend, that would be quarreling with our bread and butter.

Now just a word more for our friends generally. Every little while somebody who does not get his journal gets the foolish idea into his head that we are making money or saving something by keeping back certain numbers after we have received the pay for a whole year. Why, my good friends, of what use is a number of GLEANINGS to *us* if we should keep it instead of sending it to *you*? We count up all our subscribers and then print enough to go around, besides some extra for sample copies. If they do not get into the hands of our readers they are of no use to us at all. We should be clear daft if we did not use every effort to see that every man got his paper. Why, our advertising department alone now brings us about \$5000 a year; but our advertisers certainly would not pay us any such money unless our journals got right into the hands of people who value them and read them, advertisements and all. Don't you see?

TELLING WHAT THE WEATHER WILL BE ON A CERTAIN DAY FOR A YEAR TO COME, ETC.

Mr. A. I. Root:—I have taken GLEANINGS for quite a few years, and like it very much, but, most of all. Our Homes and Notes of Travel. You always show so much charity for every one, even those who are in the wrong, that I have wondered not a little at the occasional dig you give Hicks, the weather-man, of St. Louis. I have wondered if you ever had one of his almanacs or his paper, *Words and Works*, and kept tab on his predictions and the weather. I have for the last seven or eight years, and must say that he predicts the weather a year ahead better than Cox, the Chicago weather-prophet. Rev. Mr. Hicks makes no secret of how he foretells the weather, and any one who knows any thing of astronomy can do his own predicting.

I have taken the liberty of sending for an extra almanac to send to you, and hope you will look at it and see how it corresponds with the weather with you, and I also hope you will not be offended at my doing so, nor at what I have said, as I have not meant to be offensive.

CELIA E. THOMA.

Emerald Grove, Rock Co., Wis.

Thanks for your kind words, my good friend, and especially for what you say about charity; and may God help me to exercise that same charity in trying to shed light on this matter of predicting the weather a month ahead or a whole year. Our older readers may smile at what you say about the almanac and *Words and Works*, for the matter has come up repeatedly in years past; and I shall have to tell you that this almanac for 1904 seems like

all the rest. It is a mystery to me how anybody can think Hicks has foreknowledge of the weather for all parts of the country. Please consider for a moment that this man assumes to tell in a few brief words what the weather will be all over the *whole United States*. It would be strange indeed if there were not some spots or localities where his words would seem to fit. As an illustration, all over the North we have had, ever since the middle of November, up to to-day, January 7, the most severe winter weather we have had in twenty years, or perhaps a longer period. There has not been a single night for over two months when it did not freeze, and a good deal of the time it has been below zero. If Hicks had knowledge of what was coming, why did he not say in plain words that the fore part of the winter would be the most severe of any thing known for years past—solid winter without a single let-up—something very remarkable all through our region?

To be sure that I am not selecting special places where he did not hit it, we will commence with Jan. 1, 1904.

Things to be expected.—By the 2nd a wave of rising temperature and falling barometer will appear in western sections, cloudiness will quickly gather in the same areas, and storms of first rain and then sleet and snow will pass eastwardly over the country, on and about the 3rd and 4th. Winter thunder storms on and touching the 4th should be no surprise.

Instead of the above prediction we had at this time almost zero weather, or below zero, all over the North. Now, this is nothing particularly surprising. You may say he did not happen to hit it there; but the "things to be expected" that run all through the year 1904 are so carefully worded in a general statement that they may be made to fit a great many kinds of weather. There is hardly a winter that passes that does not have some extreme or other somewhere. Several years ago we had two weeks in January when the ground did not even freeze nights, and soft maples were in bloom. This unusual period of warm weather extended all through the North, and people began to ask the Weather Bureau if something unusual was not going to happen. At that very time I asked why Hicks did not make himself immortal by telling months ahead of this very remarkable and unusual widespread mild weather in the middle of winter. I have searched his almanacs from beginning to end, and I have never found any thing that could be fairly called an allusion to the remarkable extremes. Very likely he is a better prophet than Cox, of Chicago; but I can not for the life of me see how intelligent human beings should waste time in giving any such "prophets" any notice at all.

Our United States Weather Bureau, that costs a million of dollars a year, or something like it, is leaving no stone unturned to discover any real science about the weather. Then a small army of the best-educated men the world affords are watching the moon, the spots on the sun,

etc., and they report regularly to the world that these things have little or no effect on the weather, and yet Mr. Hicks uses page after page, and diagram after diagram, with something that he calls *science*. Now, is the Weather Bureau mistaken, with all the money they have at their command, or is it Mr. Hicks, who stands comparatively alone? The Weather Bureau is valuable to the world because it constantly gives notice two and sometimes three days ahead of all the extremes that may be expected in a thousand different localities scattered over the United States.

You say, "Hicks makes no secret of how he foretells the weather;" and, "Any one who know any thing about astronomy can do his own predicting." I would put it this way: "Any one who knows any thing about astronomy should satisfy himself in a few minutes that, while there may be some real astronomy in Hick's almanac, it is mixed up with a mass of nonsense that looks like science. Why do not the astronomers of the world—bright educated scientists—give him at least a *little* recognition of some kind? He owns up that the Weather Bureau does not recognize him."

A few years ago there was a great stir about Electropoise, and its vendors published a book that they called "Science," and they tried to make the world believe that their "twaddle" about their new invention was scientific. GLEANINGS waged unceasing war on the humbug. Where is the "humbug toy" (*price \$25.00*) with their scientific (?) explanation of it now? I wish some of those who defended it so stoutly would rise up and speak. Now consider wireless telegraphy, X rays, radium, and other *real* scientific discoveries. All the world acknowledges what is claimed for these things. There is not a dissenting voice—certainly not among all our educated scientists. If Mr. Hicks has in like manner made some new discoveries in the realm of science, as he claims, why do not our schools and colleges, and our scientific publications, recognize him?

A little further on, after my quotation from the almanac, he says, "The disturbing causes are Vulcan, Venus near the center of her disturbance, the moon in quadrature, or last quarter, and with extreme south declination." Can anybody call the above either sense or science?

In the last part of the almanac there are a good many excellent half-tone pictures of cyclones, hurricanes, etc., that have carried havoc in different parts of our land. These pictures are furnished by *request*, from different parts of the country. It would be strange indeed if he could not find a disastrous storm of some kind that occurred somewhere just after his prediction. The writer who sends the photo usually says, "This storm came just after your prediction," etc. Now, if Hicks had told exactly where the tornado would take place, as well as when, there might have been some point to it.

ROOT'S SEEDS

We are almost daily in receipt of inquiries similar to these.

"I secured a package of *Prizelaker Onion* seed from Mr. Root last year and was so pleased with it that I intended sending for more this year. Can you send me some of the same?"

"Have you a supply of Root's *Puget Sound* grown very select *Early Jersey Wakefield* cabbage seed? If so, send me by return mail your lowest price per pound."

"Root's *Grand Rapids* lettuce seed is the only lettuce seed that I ever get that every seed comes up when I plant it. Can you furnish the same stock?"

"Would like your seed catalog. I have dealt with Mr. Root for 20 years and meant to keep on. Are you selling seed like his?"

"Will you please send me your catalog? It seems that I can't get seeds anywhere that suit me as well as Root's."

In reply to all such inquiries we state that we shall furnish

ROOT'S SEEDS AT ROOT'S PRICES

All of Mr. Root's large contracted orders have been received by us. This means that we are able to fill orders with pure fresh seeds at the lowest price. We have been very fortunate in securing from the same sources as in the past, "*Puget Sound*" Cabbage and Cauliflower, "*Gilt Edge*" *Grand Rapids* Lettuce, and all varieties of Peas, Onions, and Sweet Corn.

Ask for our catalog, or cut out our offer on page 39, of Jan. 1 GLEANINGS, and mail it to us.

E. C. GREEN & SON
MEDINA, OHIO.